JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

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THE FOUNDING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

"THE idea of the forming of the AMERICAN PHARMACEUTICAL ASSOCIATION was conceived and carried out by the members of the convention of Pharmaceutists convened in the City of New York, in October 1851, to take into consideration the subject of Standards for the guidance of the special examiners of Drugs, Medicines, etc., at the several Chief Ports of Entry. . . "

The sessions were held in the rooms of the New York College of Pharmacy, No. 511 Broadway, October 15th, at 5 P.M. Charles Ellis, of Philadelphia, was appointed Chairman, and Samuel R. Philbrick, of Boston, Secretary. A committee on credentials was named, consisting of George D. Coggeshall, New York; S. M. Colcord, Boston, and A. B. Taylor, of Philadelphia. C. B. Guthrie, of New York, was elected *President*, and Alfred B. Taylor, of Philadelphia, *Secretary*, of the convention. Other delegates than those mentioned were: Thos. B. Merrick, New York, Thomas Restiaux, Boston, William Procter, Jr., Philadelphia.

The name, "American Pharmaceutical Association," was adopted at the organization meeting, held in Philadelphia, October 7, 1852. Other delegates than those heretofore named were: Joseph Laidley, Richmond; Joseph Burnett, Boston; Alexander Duval and John Purcell, Richmond; L. S. Haskell and John Meakim, New York; William B. Chapman, Charles Augustus Smith and Edward S. Wayne, Cincinnati; Daniel B. Smith, Philadelphia; David Stewart and George W. Andrews, Baltimore; Henry F. Fish, Waterbury, Connecticut.

The first officers of the organized ASSOCIATION were: *President*, Daniel B. Smith, Philadelphia; *Vice-Presidents*, George W. Andrews, Baltimore; Samuel L. Colcord, Boston; C. Augustus Smith, Cincinnati; *Recording Secretary*, George D. Coggeshall, New York; *Corresponding Secretary*, William Procter, Jr., Philadelphia.

The 1853 meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in Boston, the 1854 meeting in Cincinnati and in 1855 the sessions were held in New York. At this time an invitation was addressed "To the Pharmaceutists of the United States;" the first paragraph of the comprehensive address is quoted: "The American Pharmaceutical Association, deeply impressed with the importance of adopting some measure by which the present and future apothecaries of this country may be improved in educational standing, viewed in reference to the practice of their profession, have determined to address their brethren everywhere in our widely extended country, believing that some good results may arise from the hints they will suggest."

EDITORIAL

E. G. EBERLE, EDITOR 2215 Constitution Ave., WASHINGTON, D. C.

THE 85TH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

AMERICAN Pharmacy in all of its branches was well represented at the New York meeting in numbers and in distribution. The program was well balanced and the guest speakers brought messages of importance to the profession from the U. S. Public Health Service, the American Chemical Society and the Council on Pharmacy and Chemistry of the American Medical Association.

The Local Committee under the leadership of Hugo H. Schaefer provided the visitors with every comfort and entertainment that could be expected, and the visitors enjoyed themselves. The rearrangement of the program gave more time for entertainment and relaxation.

The theme of President George D. Beal's address ran through the entire proceedings. That the ASSOCIATION over the past twenty years had carried out a definite program; it had rearranged its form of organization so as to give the state and national associations a definite part in its work; had built and equipped a splendid home, which is free of debt, for the ASSOCIATION and related organizations; and had brought together in that building the present activities of the ASSOCIATION. The ASSOCIATION is now prepared to increase and extend its activities.

The Committee on Maintenance under the leadership of Dr. H. A. B. Dunning reported that the regular income of the ASSOCIATION had been increased through donations to an extent that will enable it to go forward with the program and the following important decisions were announced by the Council and approved by the House of Delegates.

The present JOURNAL OF THE ASSOCIATION will devote its activities to the presentation of scientific and professional material in which field it serves a very splendid and essential service, and to Pharmaceutical Abstracts; and a more popular publication will be issued monthly to provide information about the ASSOCIATION'S work and the progress of pharmacy.

One number of the JOURNAL will be known as the "proceedings number" and will contain the entire proceedings of the annual meeting including addresses and reports, but not the papers read before the sections, which will appear in the JOURNAL throughout the year. This arrangement will provide a valuable reference volume.

The National Formulary laboratory will be removed to the INSTITUTE OF PHARMACY early in 1938 and will be developed as experience indicates. A Special Committee was authorized to proceed with the furnishing and equipment of the laboratory and to supervise its operation, under the direction of Chairman E. N. Gathercoal. The coöperative research work now being carried out in schools and colleges of pharmacy and other institutions through grants from the Research Fund will be continued.

Arrangements were made to enlarge the Library and the Museum in the building and to make them more serviceable.

It was decided to reform the Committee on National Formulary effective in 1939. The ten members, to be elected one each year to insure a continuing committee, with the Chairman will constitute the Executive Committee of Revision and will meet annually preceding the A. PH. A. meeting. Each member will be the Chairman of a sub-committee to which he may appoint as many as five participating members.

These new major activities will add materially to the work carried on in the INSTITUTE OF PHARMACY and to the personnel employed. To put them into effect will, with the corollary activities, occupy the attention of the ASSOCIATION for the present.

In addition, the American Council on Pharmaceutical Education adopted final standards for the accreditment of schools and colleges of pharmacy and expects to proceed with the examination of these institutions early in 1938 with the object of issuing an accredited list in 1939. This marks a great advance in pharmaceutical education in this country.

An initial effort was made at this meeting to present, through exhibits, the U. S. P. and N. F. activities carried on throughout the country with the object of stimulating this important movement. These exhibits were very interesting and informative to those present and it is planned to increase the number at the next annual meeting with the expectation of developing an exhibit which will illustrate the scope and character of professional practice in this country.

Another important feature was the first session of the Sub-Section on Hospital Pharmacy which was established at the Dallas meeting. The officers had developed a splendid program and the attendance and interest indicated that this will become one of the strong groups in the ASSOCIATION. It provides an opportunity for the hospital pharmacists to organize within the A. PH. A. and the effort to interest them in membership will be continued.

Another important development was a joint session of the A. PH. A., the A. A. C. P. and the N. A. B. P., during which the reports of mutual interest to these associations were presented and discussed. This arrangement saves time and brings these related organizations into closer working accord.

At this joint session the Committee on the Modernization of Pharmacy Laws presented its first report. This effort was undertaken last year and has for its object the study of all existing laws affecting pharmacy, many of which have been in operation for some time, and to bring them into greater accord with modern conditions and requirements. The results are expected to be of great assistance to the state associations in their legislative efforts. The Committee on Publicity was eminently successful in bringing the message of Pharmacy to the public and the influence will promote publicity throughout the year.

Space does not permit reference to all of the activities and accomplishments of the meeting. About two hundred papers and reports were presented and the sections and conferences were well attended. Altogether it was a notable meeting and one of real progress for professional pharmacy. E. F. K.

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS.—*Chairman*, F. E. Bibbins; H. M. Burlage, W. G. Crockett, E. V. Lynn, C. O. Lee, L. W. Rising, L. W. Rowe, Heber W. Youngken, F. V. Lofgren, J. C. Krantz, Jr. (To Be Revised.)

A STUDY OF PRECIPITATION IN FLUIDEXTRACT OF UVA URSI II.*[1]

THE EFFECT OF HEAT AND SELECTIVE SOLVENTS UPON THE FORMATION OF A PRECIPITATE IN FLUIDEXTRACTS OF UVA URSI.

BY J. E. BALL[2] AND C. O. LEE.[3]

INTRODUCTION.

In a previous study of this problem, Tisher (8) showed that the precipitate which appears in the official fluidextracts of uva ursi is invariably crystalline. He described the crystals in considerable detail and suggested that their appearance could be prevented by percolating the drug with menstruums high in alcohol and glycerol content. Tisher also made extensive assays of tannin and arbutin in uva ursi, in fluidextract of uva ursi, and in the precipitate from the latter. He obtained urson and an unnamed gum-like substance from uva ursi but did not study them in detail.

The present paper is a report of our attempts to find acceptable ways of preventing the formation of a precipitate in fluidextracts of uva ursi.

EXPERIMENTAL—EXTRACTION OF UVA URSI WITH SELECTIVE SOLVENTS.

In accord with the suggestion of Lloyd (2), and Kelly and Krantz (4) an attempt was made to find a solvent that would extract the principle, or principles, responsible for the precipitation in fluidextract of uva ursi, but which would not, at the same time, remove the constituent, arbutin.

QUANTITATIVE EXTRACTION OF UVA URSI.

A series of small percolators was set up, and carefully weighed amounts of the drug percolated. The weight of each percolator was found, and the weight before and after extraction was taken. The percentage extracted was calculated from these values. The results of this experiment are shown in Table I.

TABLE I.

Sample Number.	Solvent.	Sample (Gm.).	Residue (Gm.).	Extract (Gm.).	Per Cent of Extractive.
1	Pyridine	1.7254	1.5514	0.1740	10.0
2	Ethyl Acetate	2.0430	1.7894	0.2536	12.4
3	Acetic Acid (99%)	2.7293	2.0519	0.6774	24.8
4	Acetic Acid (50%)	2.1821	1.2689	0.9332	42.7
5	Acetic Acid (10%)	2.1670	1.2553	0.9117	42.1
6	Xylol	2.7238	2.5071	0.2167	7.9
7	Amyl Alcohol	3.0732	2.7368	0.3364	10.9
8	*n*-Butanol	2.6653	2.3065	0.3588	13.5
9	Benzyl Alcohol	3.1024	..	..	..
10	Hexane	1.8815	1.7628	0.1187	6.3

* Scientific Section, A. PH. A., Dallas meeting, 1936.

[1] An abstract of a thesis submitted to the faculty of Purdue University in partial fulfilment of the requirements for the degree of Master of Science by J. E. Ball.

[2] J. K. Lilly Fellow, Purdue University, School of Pharmacy (1932–1933).

[3] Professor of Pharmacy, Purdue University, School of Pharmacy.

It will be seen that no entries have been made for residue, loss and percentage extracted for Sample 9. The percolator did not lose weight but on the contrary gained weight, though dried in a vacuum desiccator over sulfuric acid for five days before the final weighing. Our explanation for this is that addition or esterification products of benzyl alcohol were formed which were insoluble and therefore held back.

TESTS FOR ARBUTIN AND TANNIN.

A portion of each percolate obtained in Table I, was evaporated to dryness and a water extract made of the residue. This extract was freed from tannin, when necessary, by the addition of lead subacetate and subsequently freeing the solution of excess lead with hydrogen sulfide. The Jungmann Test (1) was run on the lead free-hydrogen sulfide free filtrate. The results of this experiment are shown in Table II.

TABLE II.

Sample Number.	Solvent.	Tannin.	Arbutin.	Character of Residue.	Color of Extract.
1	Pyridine	+	+	Resinous	Brown
2	Ethyl Acetate	−	−	Amorphous	Olive-green
3	Acetic Acid (99%)	+	+	Soft	Green-brown
4	Acetic Acid (50%)	+	+	Soft	Dark brown
5	Acetic Acid (10%)	+	+	Soft	Dark brown
6	Xylol	−	−	Resinous	Green
7	Amyl Alcohol	−	+	Resinous	Yellow-green
8	*n*-Butanol	−	−	Resinous	Brown
9	Benzyl Alcohol	−	+	Semi-liquid	Brown
10	Hexane	−	−	Resinous	Green-yellow

\+ Present.
− Absent.

It was found that four of the solvents used—ethyl acetate, xylol, *n*-butanol and hexane, gave residues that were free from arbutin.

MODIFIED PROCESS FOR MAKING FLUIDEXTRACT OF UVA URSI.

Two hundred and fifty Gm. of Uva Ursi were extracted with ethyl acetate. The marc was dried, ground and aired. When all odor of ethyl acetate had been dispelled from the drug it was made into a fluidextract by the U. S. P. process.

This fluidextract showed no crystalline deposit, as do those made by the official method, for ten days after manufacture. However, a flocculent precipitate was thrown down. At the end of fifty-four days this sediment amounted to about 6% of the total volume. This fluidextract and its precipitate deserve further study.

STUDY OF A FLUIDEXTRACT MADE FROM A HEAT-TREATED DRUG.

Description and Method of Preparation.—The object of this experiment was to see whether heating the drug, as a preliminary phase to the regular manufacturing process, had any effect upon the amount or character of the precipitate subsequently deposited in the fluidextract.

To this end three fluidextracts were prepared, designated as lots X, Y, Z. In each case 500 Gm. of drug were used.

For fluidextract X the drug was macerated with 200 cc. of water for one hour. The beaker and contents were then placed in an autoclave and heat applied for 15 minutes at 17 pounds pressure. The drug was then removed and spread out on a drying screen and allowed to dry for two

days. The color and general appearance of the drug were not materially affected. When moist, the drug was slightly more brown than originally, but, when dry, the color was nearly the same shade of green as that of the untreated drug. When thoroughly dry the treated material was run through a drug mill to make it uniform for percolation. The treated material was then made into a fluidextract by the regular U. S. P. process.

Fluidextracts Y and Z were prepared in the same manner, except that different pressures were used. Table III gives the amount of drug, water used for maceration, pounds pressure, corresponding temperature and time of exposure for each of the three lots of drug.

TABLE III.

Sample.	Amount of Drug.	Volume of Water Used for Maceration.	Pounds Pressure Applied.	Corresponding Temperature.	Exposure.
X	500 Gm.	200 cc.	17	125	15 min.
Y	500 Gm.	500 cc.	25	130	15 min.
Z	500 Gm.	500 cc.	25	130	15 min.

Comments.—1. Heating the drug previous to the preparation of the fluidextract changes the character of the sediment. This change is from a decidedly crystalline structure to a more or less amorphous form, the quantity being much less.

COLORIMETRIC DETERMINATION OF ARBUTIN.

Jungmann (1) reported a color reaction with arbutin and phosphomolybdic acid. The color, a deep azure blue, could, according to Jungmann, be detected in dilutions of 1:140,000. It was thought, therefore, that a quantitative colorimetric determination of arbutin should be possible.

This idea was stimulated by the fact that our study required that a number of arbutin determinations be made upon uva ursi and its preparations. The best method available for this assay is, so far as we know, that of Zechner (6), a long and tedious process. A method for the colorimetric assay of arbutin, which we found to check satisfactorily with the Zechner process, is outlined here.

A. ARBUTIN ASSAY OF UVA URSI.

A sample, 0.5 Gm. to 2.5 Gm., of the drug is macerated in boiling water for about one hour. When cool the liquid is filtered off and the residue washed, into the filtrate, which is made alkaline with ammonia water. About 20 cc. of a 10% lead acetate solution, recently filtered, is added to the alkaline infusion which is then heated for about fifteen minutes upon a water-bath and allowed to stand for two hours, previous to filtering through a Büchner filter. The filtrate is saturated with hydrogen sulfide, in the usual way, and the lead removed by filtering. The lead-free filtrate is then boiled to get rid of the hydrogen sulfide and refiltered if necessary. This solution is tested colorimetrically against the Standard Arbutin Solution.

B. ARBUTIN ASSAY OF THE FLUIDEXTRACT OF UVA URSI.

A sample of 1 to 5 cc. of the preparation is diluted to 200 cc., filtered and the residue washed. The filtrate is made alkaline with ammonia water. The procedure from this point is the same as for the infusion in A above. It is tested against the Standard Arbutin Solution.

C. PREPARATION OF A STANDARD ARBUTIN SOLUTION.

A 15- to 20-Gm. sample of arbutin is dissolved in water in a 100-cc. volumetric flask. This is the standard arbutin solution expressed as milligrams per cc.

D. CALCULATING THE ARBUTIN COLORIMETRICALLY.

Procedure: An unknown filtrate such as is described under A and B above is made alkaline with ammonia water. One cubic centimeter of a 10% phosphomolybdic acid solution is then added and the volume made up to 500 cc. volumetrically.

One cc. of the Standard Arbutin Solution, described under C above, is placed in a 100 cc. flask and diluted to about 70 cc. The solution is made alkaline by the addition of 10 cc. of ammonia water. One cc. of 10% phosphomolybdic acid is then added and the solution made up to volume.

A colorimetric reading of an unknown arbutin solution is then compared with that of the standard and the quantity of arbutin in the unknown calculated by the following formula.

$$\frac{\text{Standard Solution reading}}{\text{Unknown Solution reading}} \times 5 \times F = \text{mg. arbutin}$$

"F" represents the mg. of arbutin per cc. in the standard solution.

If a 1-cc. liquid sample is used the answer may be expressed directly as mg. per cc. When a dry drug sample weight is used, the percentage of arbutin may be calculated in the usual way.

QUANTITATIVE DETERMINATION OF TANNIN IN UVA URSI.

Tannin is present in uva ursi in rather high percentages. For this reason it seemed advisable to make extensive studies of it in the drug and its preparations.

There are numerous reports, in the literature, concerning the technique of tannin determination by the method of Löwenthall. Some of the problems discussed are: rate of addition of permanganate, speed and uniformity of agitation, and the volume to be titrated. There also seems to be some confusion as to the correct indicator.

In the numerous tannin assays, which we are reporting in part, use was made of an air-driven agitator to accomplish uniform stirring. Titrations were made in three-liter beakers using 735 to 750 cc. of solution at a time. A sample of indigocarmine, prepared by the Nelson Baker Co., was used as the indicator.

The results of our tannin assays are given in the following tables.

Table IV. I Uva Ursi Lot 44865 (Lilly); II Uva Ursi Lot 21839 (Lilly); III Tannin (Merck's, Lot 23485).

TABLE IV.

	I.*	II.*	III.[1]
Sample weight	5.283 Gm.	4.978 Gm.	1.060 Gm.
Volume of infusion	500.00 cc.	500.00 cc.	500.00 cc.
Volume of $KMnO_4$ (A)	20.39 cc.	13.04 cc.	29.05 cc.
Volume of $KMnO_4$ (B)	16.36 cc.	10.61 cc.	15.29 cc.
A minus B	4.03 cc.	2.43 cc.	13.76 cc.
Normality of $KMnO_4$	0.0455	0.0731	0.0318
Tannin equivalents	6.28%	7.99%	86.85%

* Average of three determinations.

[1] Average of two determinations.

The assays of the tannin samples indicate a considerable loss during the process. However, a number of them were made and the results were consistent and for that reason are offered.

Table V gives the averages of several tannin assays upon fluidextract of uva ursi Lot 848847 (Lilly). Attempts were made to determine the effects of filtering, not filtering, and of the addition of varying amounts of glycerin in the process of assay. The tannin equivalent is given in mg. per cc. since the sample is a liquid.

From the results indicated in Table V we are inclined to believe that a tannin infusion, even though cloudy, should not be filtered during the assay procedure. It would seem that the filtering, in this process, removes some of the reducing activity of the infusion. The addition of glycerin to the tannin infusion seems to have increased the tannin equivalent.

TABLE V.

	I.	II.	III.	IV.	V.
Volume of sample	5.00 cc.	5.00 cc.	5.00 cc.	5.00 cc.	5.00 cc.
Volume diluted to	500.00 cc.	500.00 cc.	500.00 cc.	500.00 cc.	500.00 cc.
Normality of $KMnO_4$	0.0731	0.0731	0.0692	0.0692	0.0692
Volume of $KMnO_4$ (A)	11.30	11.32	13.00	13.32	13.35
Volume of $KMnO_4$ (B)	10.10	10.70	11.19	11.35	11.79
A minus B	1.4	0.62	1.81	1.77	1.76
Tannin equivalents	42.9 mg./cc.	19.0 mg./cc.	52.4 mg./cc.	51.4 mg./cc.	41.4 mg./cc.
Alterations in procedure	Not filtered	Filtered	10 cc. glycerin added	25 cc. glycerin added	100 cc. glycerin added

SUMMARY.

1. Arbutin is not extracted from uva ursi by ethyl acetate, xylol, *n*-butanol or hexane.

2. It was found that the drug, which had been treated in the autoclave previous to percolation, yielded a fluidextract whose precipitate was not only less in quantity, but amorphous rather than crystalline in character. This suggests that enzymes may be the primary cause of precipitation in this preparation.

3. A colorimetric assay for arbutin has been devised which was found to give results comparable to the Zechner process.

4. Filtering a turbid infusion of the crude drug, previous to the determination of the tannin, gives low values of the latter and should be avoided.

REFERENCES.

(1) Jungmann, J., *Am. J. Pharm.*, 43, 202 (1871).
(2) Lloyd, J. U., PROC. A. PH. A., 30, 509 (1882).
(3) "Methods of Analysis," A. O. A. C., page 336 (1916).
(4) Kelly, E. F., and Krantz, J. C., JOUR. A. PH. A., 13, 815 (1924).
(5) Allen's Commercial Organic Analysis, 5, 112, 5th Edition (1927).
(6) Zechner, L., *Pharm. Monatsh.*, 10, 194 (1929).
(7) "Methods of Analysis," A. O. A. C., page 155 (1930).
(8) Tisher, H. L., "A Study of Precipitation in Fluidextract of Uva Ursi." (Thesis, Purdue University, 1932.)—(Published in July JOURNAL.)

A STUDY OF PRECIPITATION IN FLUIDEXTRACT OF UVA URSI III.*[1]

IDENTIFICATION OF THE CRYSTALLINE PRECIPITATE IN FLUIDEXTRACT OF UVA URSI.

L. M. PARKS[2] AND C. O. LEE.[3]

INTRODUCTION.

The manufacture and storage of fluidextract of uva ursi has been a troublesome problem due to the fact that it continues to develop a sediment over a long

* Scientific Section, A. PH. A., Dallas meeting, 1936.

[1] An abstract of a thesis submitted to the faculty of Purdue University in partial fulfilment of the requirements for the degree of Master of Science by L. M. Parks.

[2] Assistant in Pharmacy, Purdue University, School of Pharmacy.
[3] Professor of Pharmacy, Purdue University, School of Pharmacy.

period of time. Scoville (7) suggested that this was due to a hydrolysis of the tannin present. Tisher (11) observed that the precipitate was microcrystalline in character. He studied its physical properties but was unable to identify it. Ball (13) followed up the work of Tisher and showed that precipitation in fluidextract of uva ursi could be changed in character and lessened in amount by subjecting the drug to autoclave heat before extracting it.

The object of this study was that of the identification of the micro-crystals which constitute the larger part of the precipitate in the official fluidextracts of uva ursi. To do this it was necessary to repeat much of the work of Tisher, Ball and others, but the details will be omitted here.

CONSTITUENTS OF UVA URSI.

The glucoside *arbutin* is, perhaps, the most important therapeutic constituent of uva ursi. It yields hydroquinone upon hydrolysis, to which the urinary antiseptic action of uva ursi and its preparations is generally attributed. Arbutin is accompanied, according to Zechner (9), by varying amounts of its methyl derivative.

Urson, more recently named ursolic acid, also occurs in uva ursi. Its chemical nature seems to be uncertain. It has been classed by van der Haar (6) as a phytosterol-like substance with a formula $C_{30}H_{48}O_3$, identical with prunol from the leaves of Prunus serotina, and malol from the wax coats of apples.

Ericolin, $C_{34}H_{56}O_{21}$, was isolated by Kawalier in 1852. It is a brownish yellow, sticky resin, of bitter taste, which upon hydrolysis yields glucose and ericinol, $C_{10}H_6O$, a volatile, peculiarly odorous oil.

Other constituents, according to Wehmer (10), which have been isolated from uva ursi are, gallic acid, tannin, quercetin, myricetin, citric acid, malic acid, resin, wax, fat, quinic acid, and formic acid.

Perkin (2) reported the presence of ellagic acid but his results were not confirmed by Keegan (5).

EXPERIMENTAL.

Our first task was that of collecting a quantity of the crystalline precipitate for study. This was done by preparing a number of samples of the official fluidextract in 500- and 1000-cc. amounts. This afforded opportunities to observe the appearance, character, and rate of formation of the precipitate.

It was clearly shown that the crystalline precipitate was not extracted from the drug but formed in the percolate upon standing a few hours.

The precipitate was found to be, for the most part, composed of slender, needle-like, microcrystals with small bits of plant tissue and coloring matter adhering to them. When dried, after being washed with water, they were of a gray-green appearance.

EXAMINATION OF THE CRYSTALLINE PRECIPITATE.

Ignition.—Upon being ignited the crystals burned with a yellow luminous flame, yielding a very small ash residue, indicating the organic nature of the precipitate.

Calcination.—When the precipitate was subjected to calcination a yellow, crystalline sublimate appeared. Additional heating caused the sublimate to pass off as a yellow, odorless vapor. This observation deserves further study.

Melting Point.—The precipitate was subjected to capillary tube melting point tests. It failed to melt at 360° but darkened to a light brown.

Sodium Analysis.—By means of sodium decomposition and subsequent analysis, sulfur, nitrogen and the halogens were shown to be absent. This was indicative of the organic nature of the precipitate.

Inorganic Analysis.—When treated with concentrated nitric acid a reaction occurred with evolution of brown fumes of NO_2 and a reddish brown liquid was the result. This liquid gave positive tests for the presence of iron, aluminum, potassium and silicates, in small amounts, together with traces of calcium. The acid-soluble ash from the ignition of the precipitate gave tests for the presence of these same elements.

Solubility Tests.—The solubility of the precipitate was tested according to Kamm's (12) classification reagents. The results were as follows:

Insoluble in water, ether and 5% HCl
Partially soluble in KOH 5%, and sulfuric acid
Warm sulfuric acid produced a charring effect

Ferric Chloride Test.—Ferric chloride T.S., when added to the dry precipitate, gave a green coloration which developed into an inky blue upon standing.

CONCLUSIONS.

These tests led to the conclusion that the crystalline precipitate was chiefly organic in character. The ferric chloride test indicated that it was a phenol of some kind.

ATTEMPTS TO PURIFY THE CRYSTALLINE PRECIPITATE.

The recrystallization of a substance from a suitable solvent is often an acceptable means of purification, but in this case the precipitate resisted solution in any of the ordinary solvents. It became dispersed when subjected to hot methyl, ethyl and butyl alcohols but was not dissolved to any extent.

Dilute solution of potassium hydroxide acted as a solvent and upon acidulating the solution with hydrochloric acid a precipitate was produced. From all appearances it was assumed, however, that the original crystals had been decomposed by the alkali and that the precipitate from the acid solution was not a purified product.

THE CRYSTALLINE PRECIPITATE IDENTIFIED AS ELLAGIC ACID.

Perkin (2) reported that ellagic acid was present in uva ursi. The descriptions for it, both chemical and physical, suited those of our crystalline precipitate. A preliminary analysis upon the impure precipitate showed a carbon and hydrogen content which approximated that of ellagic acid. The crystalline precipitate also gave the Griessmayer (1) test for ellagic acid.

The purification of ellagic acid, by recrystallizing it from a hot pyridine solution, was reported by Perkin and Nierenstein (3). They also obtained an acetyl derivative of it which gave a melting point of 343–346°.

On the assumption that our crystalline precipitate was essentially ellagic acid, it was purified by repeated recrystallization from boiling pyridine. The purified crystals were washed with ethyl alcohol and dried for twenty-four hours at 120° and subjected to an elementary microanalysis, the results of which are given in Table I following.

TABLE I.

Weight of Sample.	Weight of Carbon Dioxide.	Weight of Water.	Per Cent Carbon.	Per Cent Hydrogen.
0.018779 Gm.	0.038737 Gm.	0.003902 Gm.	56.25	2.31
0.018913 Gm.	0.038553 Gm.	0.003788 Gm.	55.59	2.23
0.017413 Gm.	0.035477 Gm.	0.003964 Gm.	55.56	2.53

The percentage of carbon in ellagic acid, $C_{14}H_6O_8$, is 55.63 and that of hydrogen 1.99.

From the results of this analysis and the physical characteristics of the crystalline precipitate, which forms in fluidextract of uva ursi, we have concluded that it is identical with ellagic acid.

This assumption is further supported by the fact that we were able to prepare by the method of Perkin and Nierenstein (3), an acetyl derivative of our precipitate which melted at 342–345°.

ELLAGIC ACID AND ELLAGITANNIN.

Ellagitannic acid, from which ellagic acid is produced by hydrolysis, is one of the most widely diffused of all the natural yellow coloring matters. It is often found with gallotannin in nature. Its most common sources are divi divi pods, knopper galls, myrobalans, and other tannin-like substances. The separation of ellagic acid from extracts of these tannin-bearing plant materials has often been observed. The cause of its formation, according to most investigators, is due to the action of a ferment, or enzyme, which hydrolyzes the ellagitannin into ellagic acid and its other components.

ELLAGIC ACID IN UVA URSI.

Perkin (2) reported that ellagic acid existed in uva ursi leaves. Using the method of Nierenstein (4) for the detection of ellagic acid we were unable to detect it, *per se*, in uva ursi. A search of the literature also revealed the fact that ellagic acid, as such, has never been shown to exist, with certainty, in any plant tissue.

SUMMARY.

1. The microcrystalline precipitate occurring in the official Fluidextract of Uva Ursi has been identified as ellagic acid.

2. It has been shown that ellagic acid does not exist in uva ursi but is formed in the fluidextract upon standing.

REFERENCES.

(1) Griessmayer, —, *Ann. Chem. U. Pharm.*, 160, 50 (1871).
(2) Perkin, A. G., *Proc. Chem. Soc.* (Apr. 21, 1898).
(3) Perkin, A. G., and Nierenstein, M., *J. Chem. Soc.*, 87, 1412 (1905).
(4) Nierenstein, N., *Ber.*, 42, 353 (1909).
(5) Keegan, P. Q., *Chem. News*, 108, 61 (1913).
(6) van der Haar, A. W., *Rec. trav. chim.*, 43, 367; 542 (1924).
(7) Scoville, W. L., Jour. A. Ph. A., 16, 1136 (1927).
(8) Lauer, W. M., and Dabrovalny, F. J., "*Pregl-Festschrift* für Mikrochemie," 1st Edition, page 243 (1929).
(9) Zechner, L., *Pharm. Monatsh.*, 12, 4 (1931).
(10) Wehmer, C., "Die Pflanzenstoffe," 2nd Edition, page 1913 (1931).
(11) Tisher, H. L., Thesis, Purdue University (1932). (In July issue.)
(12) Kamm, O., "Qualitative Organic Analysis," 2nd Edition (1932).
(13) Ball, J. E., Thesis, Purdue University (1933). (In August issue.)

The Program of the Scientific Section listed eighty-three papers for the 85th annual meeting of the American Pharmaceutical Association, held in New York City.

Dr. Autun Urgoc-Richard Wasicky, *director* of the Pharmacological Institute, Vienna, Austria, was elected *Honorary Member* of the American Pharmaceutical Association.

A STUDY OF PRECIPITATION IN FLUIDEXTRACT OF UVA URSI IV.*[1]

THE CAUSE OF THE CRYSTALLINE PRECIPITATE IN FLUIDEXTRACT OF UVA URSI AND ITS PREVENTION.

L. M. PARKS[2] AND C. O. LEE.[3]

INTRODUCTION.

The identification of the crystalline precipitate which forms in the official fluidextract of uva ursi has been described in a preceding paper. The present paper deals with the probable cause and prevention of its formation. Any treatment that would yield a fluidextract having no precipitate, when such were the rule, naturally raises the question as to the effect upon the value of the finished product. This has led to numerous assays for arbutin, the chief active agent of uva ursi and its preparations.

PREVENTION OF THE PRECIPITATION IN FLUIDEXTRACT OF UVA URSI.

Ball (2) found that the amount of precipitate in fluidextract of uva ursi was greatly diminished, and its crystalline character changed, if the drug were subjected to the action of steam under pressure, for a time, prior to its percolation. His experiments, though not conclusive, were of sufficient interest to warrant repetition and further study. Our procedure and results are given here.

The drug, prior to extraction, was placed in an autoclave at five pounds pressure, corresponding to a temperature of 110°, for a period of thirty minutes, on each of three successive days. A fluidextract made from the drug treated in this manner precipitated only slightly, and the small amount of sediment which formed contained but very few of the crystals which are usually found in considerable quantity.

Fluidextracts which we have prepared from the heat-treated drug, after the manner described, have remained almost free from sediment after several months. The results of this treatment would seem to confirm our belief that the precipitate in fluidextracts of uva ursi is the result of the action of enzymes.

THE EFFECT OF HEAT UPON THE ARBUTIN IN UVA URSI.

Any means of prevention of the precipitate in the fluidextract would be of little value if the active constituent of the drug were altered or decomposed by it. For this reason it seemed that arbutin assays should be made upon the fluidextracts from the heat-treated drug.

Zechner (1) reported a method for the quantitative determination of arbutin. Grimme (3) offered a modification of Zechner's method. This assay is long and tedious but Tisher (1932), Ball (1933) and Parks (1936) have been able to obtain consistent results with it. The twelve assays of arbutin, which are summarized in Table I following, were made by a combined and modified method of Zechner and Grimme. Since our modification is but a slight variation from the procedures cited, it will not be given in detail.

From these results it will be seen that the arbutin content of a fluidextract made from the heat-treated drug is somewhat lower than that of the untreated drug

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* Scientific Section, A. PH. A., Dallas meeting, 1936.

[1] An abstract of a thesis submitted to the faculty of Purdue University in partial fulfilment of the requirements for the degree of Master of Science by L. M. Parks.

[2] Assistant in Pharmacy in Purdue University, School of Pharmacy 1934–1936.

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TABLE I.

Sample Number. Each Is an Average of Six Assays.	Arbutin Content of 25 Cc. of Fluidextract. Official Fluidextract of Uva Ursi.	Fluidextract from Uva Ursi Which Had Been Subjected to the Autoclave.
1	2.0390 Gm.	1.8624 Gm.
2	1.9638 Gm.	1.8402 Gm.

of the same lot. However, the arbutin content of the modified fluidextract is but slightly decreased, while the product is much more elegant.

One of the objectives of this investigation was that of finding a way of preparing fluidextract of uva ursi which would not sediment upon standing and which, at the same time, would be therapeutically valuable. We believe that this has been accomplished.

EVIDENCES OF AN ENZYME IN FLUIDEXTRACT OF UVA URSI.

It has been stated that the presence of ellagic acid, as a precipitate in liquid extracts of tannin-bearing drugs, is due to the hydrolysis of ellagitannin by means of an enzyme. No such enzyme, however, has been isolated.

The fact that we were able to obtain a fluidextract of uva ursi, from a heat-treated drug, which did not yield the usual crystalline precipitate identified as ellagic acid, has led us to assume that an enzyme is the cause of precipitation in this preparation.

In support of the belief that the crystalline (ellagic acid) precipitate in the official fluidextract of uva ursi was due to the action of an enzyme, the following experiment was carried out.

Two hundred and fifty Gm. of uva ursi were heat-treated, as previously described, and extracted. The first 200 cc. of the percolate were set aside as the reserve percolate and labeled C. After five months no precipitation had occurred.

At this time two lots of 250 Gm. of uva ursi, untreated, were used to prepare the official fluidextract. The first 200 cc. of each was set aside as the reserve percolates, and labeled A, and B, respectively.

One hundred cc. of percolate C were then added to 100 cc. of each A and B percolates and well mixed. The remaining 100 cc. of each, A and B percolates, served as controls. After four months the four lots of fluidextract were filtered and the precipitates weighed. The results are given in Table II following.

TABLE II.

Sample.	Weight of Precipitate.
100 cc. Fluidextract A, + 100 cc. Fluidextract C	0.5254 Gm.
100 cc. Fluidextract A, Control	0.3366 Gm.
100 cc. Fluidextract B, + 100 cc. Fluidextract C	0.5031 Gm.
100 cc. Fluidextract B, Control	0.3611 Gm.

These results indicate that a fresh fluidextract, made from the untreated uva ursi leaves, contains some agent which, when added to a second fluidextract in which precipitation had been prevented, caused the latter to deposit the usual crystalline (ellagic acid) precipitate. This is, we believe, indicative of enzymatic action.

SUMMARY.

1. A method has been proposed for the manufacture of a Fluidextract of Uva Ursi in which the crystalline (ellagic acid) precipitate is prevented.

2. Experiments have been made which indicate that the crystalline (ellagic acid) precipitate in Fluidextract of Uva Ursi is due to enzyme activity.

REFERENCES.

(1) Zechner, L., *Pharm. Monatsh.*, 10, 169 (1929).
(2) Ball, J. E., Unpublished thesis, Purdue University (1933). (In this issue.)
(3) Grimme, C., *Pharm. Zentralh.*, 74, 669 (1933).

SOME NOTES ON THE TOLUENE MOISTURE DETERMINATION.*

BY H. GEORGE DEKAY.[1]

The determination of moisture by the toluene method was introduced into the eleventh revision of the United States Pharmacopœia for the first time. The purpose of this work is to compare the oven-drying method of moisture determination with the recommended procedure.

HISTORICAL.

The determination of moisture by distilling the sample with a liquid immiscible with water was first used by Marcusson in 1905 (1). Xylene was used as the immiscible liquid. Rogers (2) proposed the use of toluene to determine the moisture in leather. He used essentially the same procedure as that recommended by Marcusson. Dean and Stark (3) devised an apparatus in which the sample was refluxed with a liquid immiscible with water. The apparatus recommended in the eleventh revision of the U. S. P. is a modification of the Dean-Stark apparatus. Burns (4) used the xylene method in his work on the moisture content of aromatic drugs. Chow (5) found that the results of the xylene method were distinctly lower than those obtained by the oven-drying method. A number of investigators have used the distillation method with varying degrees of success. The collaborative work of Hoch and Prout on the moisture content of crude drugs led to the adoption of toluene as the immiscible liquid in the United States Pharmacopœia XI. They found that the one-hour distillation period recommended by Dean and Stark was not sufficient to obtain all of the moisture from ginger, acacia and asafœtida. The period of distillation is dependent upon the time required to remove all of the moisture from the crude drug.

EXPERIMENTAL.

A number of crude drugs were used in these experiments which had been purchased as official products. They were subjected to the oven-drying and the toluene distillation methods for moisture determination. The drugs selected were grouped into three main divisions, *First*, Drugs containing an official moisture standard; *Second*, Drugs which contained a volatile oil; and *Third*, Drugs containing resins. The drug was placed into an Erlenmeyer flask of 250–500

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* Scientific Section, A. PH. A., Dallas meeting, 1936.

[1] Purdue University, School of Pharmacy.

cc. capacity and carefully mixed with dry sand. The toluene was added and the distillation carried out, using an electric hot plate as a source of uniform heat.

Satisfactory results were obtained with a three-hour heating period. A blank determination was made on the sand and toluene. The apparatus was calibrated using a bureau of standards calibrated burette.

The following table shows the relationship between the oven-drying and the toluene drying method for the determination of moisture in the first division of drugs listed previously.

TABLE I.

Toluene Method.				Oven-Drying Method.			
No.	Wt. of Drug.	Moisture, Cc.	Per Cent.	No.	Wt. of Drug.	Loss of Weight.	Per Cent.
Acacia.							
1	25.000	2.65	10.6	1	20.8830	2.4097	11.54
2	20.000	2.15	10.75	2	12.8694	1.4588	11.33
3	10.000	1.05	10.50	3	6.4485	0.7266	11.26
	Average		10.62		Average		11.38
Amylum.							
1	25.000	2.05	8.20	1	20.000	1.9219	9.10
2	20.000	1.60	8.00	2	15.000	1.3597	9.06
3	15.000	1.20	8.00	3	10.000	0.9004	9.04
	Average		8.07		Average		9.07
Gentian.							
1	23.319	1.2	5.15	1	18.3896	1.0837	5.89
2	12.648	0.72	5.69	2	12.7726	0.7655	5.99
3	6.108	0.30	4.91	3	7.0325	0.4285	6.09
	Average		5.03		Average		5.99
Glycyrrhiza.							
1	12.179	0.60	4.92	1	11.5699	0.7108	6.14
2	8.554	0.44	5.14	2	9.0536	0.5832	6.44
3	5.681	0.30	5.28	3	5.4235	0.3332	6.14
	Average		5.17		Average		6.24

The toluene method consistently gives a lower percentage of moisture than the oven-drying method. There is an apparent difference of approximately one per cent. This corresponds to the experience of different workers using this method (4, 5). The difference may be due to the oven-drying method causing a loss in weight of some constituent which is calculated as moisture.

Table II is a comparison of these same methods on drugs which contain a volatile oil as one of their constituents.

TABLE II.

Toluene Method.				Oven-Drying Method.			
No.	Wt. of Drug.	Moisture, Cc.	Per Cent.	No.	Wt. of Drug.	Loss in Weight.	Per Cent.
Anise.							
1	17.100	0.95	5.55	1	12.9326	0.7557	5.84
2	12.883	0.70	5.43	2	10.1427	0.5884	5.80
3	9.304	0.50	5.37	3	6.4110	0.3794	5.87
	Average		5.45		Average		5.84

			Caraway Seed.				
1	13.355	0.72	5.31	1	13.8017	0.9811	7.11
2	10.687	0.55	5.14	2	8.6043	0.6163	7.16
3	7.983	0.45	5.64	3	4.2267	0.3014	7.13
	Average		5.39		Average		7.13
			Cardamom Seed.				
1	10.380	0.90	8.67	1	13.2373	1.3996	10.57
2	8.228	0.70	8.50	2	9.2357	0.9321	10.10
3	4.466	0.40	8.95	3	6.3620	0.6774	10.65
	Average		8.71		Average		10.43
			Black Mustard.				
1	13.091	0.52	3.97	1	13.5598	0.8236	6.07
2	9.147	0.40	4.37	2	8.1341	0.5076	6.24
3	7.895	0.35	4.44	3	5.3667	0.3406	6.22
	Average		4.26		Average		6.22
			Peppermint.				
1	5.248	0.37	7.05	1	8.0947	0.6105	7.54
2	4.207	0.30	7.13	2	8.5201	0.6634	7.61
3	3.033	0.22	7.25	3	5.2689	0.4060	7.70
	Average		7.14		Average		7.62

The volatile oil determination of the tenth revision of the United States Pharmacopœia was used with peppermint and it was found that the average of three determinations gave a yield of 0.32%. When this is subtracted from 7.62% of the oven drying method, it will still be above that of the toluene determination. The volatile oil determinations on all of these drugs has not been completed but will be reported at a future date.

Table III is a comparison of the same methods as those of Table I and II except it involved drugs having a resin as a constituent.

TABLE III.

Aloe.

	Toluene Method.				Oven-Drying Method.		
No.	Wt. of Drug.	Moisture, Cc.	Per Cent.	No.	Wt. of Drug.	Loss of Weight.	Per Cent.
1	25.000	0.85	3.40	1	16.000	0.6300	3.93
2	20.000	0.65	3.25	2	12.000	0.4708	3.92
3	14.000	0.45	3.21	3	4.000	0.1550	3.87
	Average		3.29		Average		3.91
			Jalap.				
1	21.033	0.55	2.61	1	20.8739	0.6155	2.94
2	12.2566	0.30	2.45	2	15.6454	0.4625	2.95
3	11.5982	0.28	2.41	3	6.7513	0.2042	2.99
	Average		2.49		Average		2.96

CONCLUSIONS.

The toluene method of moisture determination gives concordant results. This method gives results which are consistently below those obtained by the oven-drying method.

A three-hour distillation period is sufficient for most drugs.

The method can be used for determining moisture in some drugs containing a volatile constituent.

REFERENCES.

(1) Marcusson, "Mitt. kgl Material Prüfungsamt," 23, 381 (1905), through *Ind. Eng. Chem.*, 17, 147 (1925).

(2) Rogers, *Bur. Chem., Bull.*, 137, 172 (1910), through *Ind. Eng. Chem.*, 17, 147 (1925).

(3) Dean and Stark, *Ibid.*, 12, 486 (1920).

(4) Burns, JOUR. A. PH. A., 10, 272 (1921).

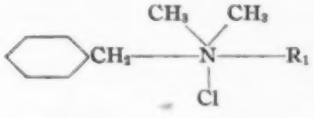
(5) Chow, *Ibid.*, 11, 17 (1922).

ANTISEPTIC PROPERTIES OF ALKYL-DIMETHYL-BENZYL-AMMONIUM CHLORIDE.*

BY PAUL G. HEINEMAN.[1]

INTRODUCTION.

The preparation investigated is of special interest because it is related to a group of chemical compounds, whose germicidal properties are apparently little understood. The chemical structure of the preparation is



(1)

It represents a mixture of high molecular alkyl-dimethyl-benzyl-ammonium chlorides, in which the high molecular alkyl residue (R_1) is composed of the alkyl radicals C_8H_{17}, $C_{10}H_{21}$, $C_{12}H_{25}$, $C_{14}H_{29}$, $C_{16}H_{33}$ and $C_{18}H_{37}$. The source of these radicals is the mixture of fatty acids of coconut oil in original proportion. Inasmuch as these fatty acids in coconut oil occur in constant proportion, this relationship holds in the final product resulting in a preparation of uniform composition.

The product is freely soluble in water, forming a clear, almost colorless solution. It is soluble also in acetone and in alcohol, but insoluble in ether and only slightly soluble in benzol. The aqueous solution is slightly alkaline to litmus. It possesses an aromatic odor and foams like soap on shaking. Aqueous solutions have an acrid taste, which disappears as dilutions increase.

Studies of antiseptic properties of the ammonium chloride compound have been carried on for a period of more than two years. The following standard procedures were applied:

1 Phenol coefficient determinations.
2 Inhibition and penetration tests.
3 Tests for disinfection of the human skin.
4 Destruction of spores of bacteria and fungi.

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[1] Bacteriological Laboratory, Winthrop Chemical Company, Inc., Rensselaer, New York.

Results of this investigation will be grouped under the aforementioned four headings.

1. PHENOL COEFFICIENT DETERMINATIONS.

The method of the Food and Drug Administration (2) was followed with one slight modification. Tests for bacteriostasis according to official directions were made by carrying over a small amount of the first subculture to a tube containing ten cc. of F. D. A. broth. In this work, the second subculture was incubated for seven days at 37° C. because prolonged contact of bacteria with an antiseptic tends to retard growth. Exhaustive tests for bacteriostasis appear to be imperative to avoid excessively high coefficient figures. Numerous additional tests were made by adding one-half cubic centimeter of sterile horse serum to five cubic centimeters of antiseptic, before adding the culture, in order to test its potency in the presence of organic matter.

Phenol controls were made with each test and when the resistance of the organism did not meet requirements the tests were disregarded. Such conditions were minimized by preparing daily cultures of the test organism.

Presence of bacteriostasis was determined by preparing subcultures of all negative cases, which approached the concentration used for calculation of coefficients. Separate tests were made at 20° C. and at 37° C.

The following organisms were used: *Eberthella typhi*, Hopkins strain; *Staphylococcus aureus*, Government strain 209; *Streptococcus pyogenes;* and *Escherichia Coli*. The first two types were obtained from the bacteriological laboratories of the Food and Drug Administration, while the other two types were isolated in our laboratories. In the following table the number of tests made are recorded and average figures appear in Column 5.

SUMMARY OF PHENOL COEFFICIENTS OF ALKYL-DIMETHYL-BENZYL-AMMONIUM CHLORIDE.

Organism.	Temperature of Medication.	Organic Matter.	Number of Tests.	Average Coefficient.
		None	12	271
		Serum	6	72
Eberthella typhi	37° C.	None	7	176
	20° C.	Serum	5	51
		None	13	293
Staphylococcus aureus	37° C.	Serum	6	154
		None	9	275
	20° C.	Serum	5	104
Streptococcus pyogenes	37° C.	None	7	272
		Serum	5	129
Escherichia coli	37° C.	None	3	318

The figures stated in Column 5 of the table show that coefficients are reduced by addition of 0.5 cc. horse serum to 5 cc. of antiseptic. The figures further show that the efficacy of the compound increases with the temperature of medication.

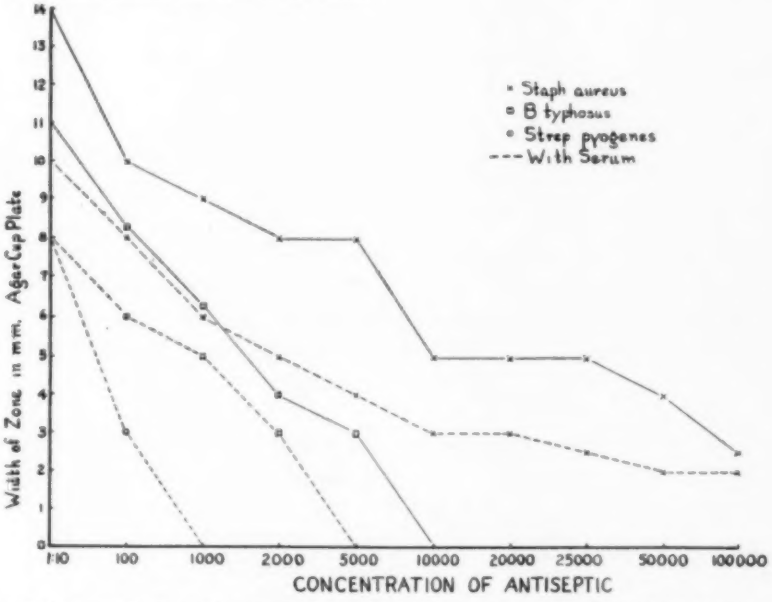
Tests were also made with a ten per cent solution of the compound in 95 per cent ethyl alcohol. Concentrations required for carrying out the tests were made by using distilled water as diluent, in accordance with recognized phenol coefficient technique. Therefore the amount of ethyl alcohol contained in dilutions was reduced to a negligible quantity. The temperature of medication was 20° C.

The average of three tests with *Eberthella typhi* was 176 and for three tests with *Staphylococcus aureus* was 275. Both tests virtually agreed with the results obtained, when the aqueous solution was used. It should be stated that a number of the determinations which appear in the table were made with the same stock solution. This solution was tested within two weeks of preparation. Later tests were made with the same solution after 3, 5, 9 and 14 months. Inasmuch as the results showed no decrease in coefficient the assumption appears justified that the aqueous solution remains stable for at least fourteen months.

2. PENETRATION AND INHIBITION TESTS.

Penetration and inhibition tests were made according to the Agar Cup-Plate method of the Food and Drug Administration. A sterilized rubber stopper of

The chart shows the following facts:



Inhibitory effect of the ammonium chloride compound in decreasing concentrations on the test organisms.

suitable diameter was placed in the center of a Petri dish before pouring the agar. The stopper is removed readily after the agar has solidified in the Petri dish, and by this means the chance of contamination from the air is reduced.

A large number of such tests was made with cultures of *Eberthella typhi*, *Staphylococcus aureus* and *pyogenes*. In all cases duplicate plates were prepared, one with the addition of ten per cent horse serum, the other without serum.

The most comprehensive series will be given in some detail.

Ten solutions of the ammonium chloride compound were prepared in distilled water, *i. e.*, 1 in 10, 1 in 100, 1 in 1000, 1 in 2000, 1 in 5000, 1 in 10,000, 1 in 20,000, 1 in 25,000, 1 in 50,000 and 1 in 100,000. One plate of each concentration was prepared with plain agar and the other plate with plain agar with the addition of ten per cent horse serum. For *Streptococcus pyogenes* serum agar only was used, because it was not possible to produce abundant growth on plain agar

consistently. Accompanying chart shows the results graphically, abscissæ showing the concentration of the solutions and ordinates giving the widths of the clear zones in mm.

The largest zones were formed by *Staphylococcus aureus*, with *Eberthella* as a close second, and *Streptococcus pyogenes* had the smallest zone. In both *Eberthella typhi* and *Staphylococcus aureus* the zones were consistently smaller in serum agar than in plain agar. *Staphylococcus aureus* was inhibited in a concentration of 1:100,000 both in plain agar and in serum agar, although the latter inhibited in lesser degree than the former. *Eberthella typhi* was not inhibited in a concentration of 1:10,000, but was inhibited in a concentration of 1:5000. The limit of inhibition is therefore somewhere between the two concentrations. *Streptococcus pyogenes* was inhibited in a concentration of 1:100, but not in 1:1000.

A five per cent solution of phenol was prepared and tested as control. For *Eberthella typhi* it was 11 m./m. in plain agar and 10 m./m. in serum agar. For *Staphylococcus aureus* it was 9 m./m. in plain agar and 7 m./m. in serum agar. For *Streptococcus pyogenes* it was 5 m./m. in serum agar.

The Agar Cup-Plate method was applied to test inhibitory action of a solution of the ammonium chloride compound on the spores of *Trichophyton gypseum*. A seven-day culture on Sabouraud's honey agar was scraped off and suspended in a sterilized bottle containing physiologic sodium chloride solution and some glass beads. The mixture was shaken in a machine designed for preparing bacterial vaccines. The suspension was strained through sterile cheese cloth and the number of spores adjusted to 10,000 per cubic millimeter, using a Hausser counter to determine the number of spores. From this spore suspension agar cup plates were prepared with Sabouraud's honey agar, both plain agar and serum agar. In plain agar a large clear zone of 20 m./m. width developed, while in serum agar the width of the clear zone was 14 m./m. These tests illustrate the inhibitory effect of the solution.

Efficacy of the ammonium chloride compound in oil was determined by the official Agar Cup-Plate method both with serum and without serum, using *Staphylococcus aureus* as test organism. The following solutions were prepared:

1. 0.05 Gm. of the compound in 50 cc. cotton seed oil. (0.1%.)
   A clear zone of 5 m./m. width appeared on plain agar, and a zone of 3 m./m. on serum agar.
2. 0.1 Gm. of the compound was dissolved in 100 cc. of mineral oil. (0.1%.)
   A clear zone of $5^1/_2$ m./m. width formed in plain agar, and a zone of 3 m./m. in serum agar.
3. 0.1 Gm. of the compound in a mixture of 50 cc. each of mineral oil and cotton seed oil. (0.1%.)
   A clear zone of 4 m./m. width was formed in plain agar, and a zone of 3 m./m. in serum agar.
4. 0.1 Gm. of the compound in a mixture of 5 Gm. lanolin and 95 cc. of mineral oil. (0.1%.)
   A clear zone of 4 m./m. width formed in plain agar and a zone of 3 m./m. in serum agar.

Clear zones, which appear in agar cup plates, show the ability of the solution to penetrate agar jelly. The clear zones may be caused either by inhibition of growth or by actual destruction of the organism. In the series of tests, which has been described, small amounts of the clear agar were transferred to tubes contain-

ing ten cubic centimeters of F. D. A. broth, but in all cases growth failed to appear. Therefore the organisms were actually destroyed. In phenol coefficient tests, aqueous solutions are used and penetration is readily accomplished. In agar cup-plate tests the solution meets with some resistance from the agar jelly, and when serum is added resistance increases. Solutions in oil naturally meet with greater resistance than do aqueous solutions. It is clear, therefore, that concentrations in agar cup-plate tests do not necessarily yield results comparable with those obtained in phenol coefficient tests.

In high concentrations of the ammonium chloride compound an opaque zone appeared at the edge of the central cup and this opaque zone was surrounded by a clear zone. After planting small pieces of the opaque zone in tubes containing broth, and incubating these tubes, no growth appeared, showing that the organisms were actually destroyed. Therefore, the opacity was probably the result of precipitation of agar.

If results obtained in agar cup-plate tests with *Eberthella typhi*, for example, are compared with those of phenol coefficient tests with the same organism, it is found that there was no clear zone around a concentration of 1:10,000, while in phenol coefficient tests the organism was destroyed in ten minutes in a concentration of 1:40,000. The difference is really greater than these figures indicate because in the agar cup plate, destruction may continue for the incubation period of 48 hours, while in the phenol coefficient test the time limit was ten minutes.

3. SKIN DISINFECTION TESTS.

Skin disinfection tests were made with two solutions each containing ten per cent of the dry compound using 95% ethyl alcohol for one of the solutions and distilled water for the other. A total of four tests was made on two individuals.

The hands were scrubbed for eight minutes with a brush, using hot water and soap, after which they were dried with a sterilized towel. The fingers were then immersed for five minutes in the test solution and were washed in sterile water. Agar was liquefied and, after cooling to 45° C., was poured over the fingers and collected in sterilized petri dishes. This part of the work was carried out in a booth used for bacteriological work.

The plates were incubated at 37° C. and observations recorded after one, two and five days. In order to detect small colonies the plates were examined under a microscope as well as with a hand lens.

No colonies could be detected.

A more sensitive method for making skin disinfection tests is described by Allen, Moorhead and Edgerley (3).

The same individuals submitted to this test and the same solutions were used as stated above. The technique described by the authors was rigidly followed. The inoculated broth tubes and the agar plates were incubated at 37° C. for five days. At the termination of the period of incubation the broth tubes and agar plates showed no growth.

It might be stated that neither of the test subjects showed immediate or deferred evidence of skin irritation by application of a ten per cent solution of the ammonium chloride compound. Similar skin disinfection tests should be made with lower concentrations of the compound.

4. DESTRUCTION OF SPORES OF BACTERIA AND MOLDS.

A series of tests was made with the object of determining the destructive effect of a solution of the ammonium chloride compound on spores of *Bacillus subtilis*, *Trichophyton gypseum* and a *Mucor*, which was isolated from milk. *Bacillus subtilis* was grown in broth for three days. There was abundant growth, and microscopic examination showed the presence of profuse spore forma-

tion. One four-millimeter loopful of the well-shaken culture was placed in five cc. of various concentrations of the compound. From the mixture one four-millimeter loopful was transferred to tubes containing ten cc. of F. D. A. broth, at certain time intervals. These tubes were incubated for seven days at 37° C.

The molds were grown on Sabouraud's honey agar for seven days at room temperature. The growth was scraped off and shaken in physiological sodium chloride solution in a shaking machine. The number of spores was adjusted to 10,000 per cmm. From these spore suspensions one-tenth of a cc. was introduced into tubes containing ten cc. of the test solution. Finally, after definite time intervals, one four-millimeter loopful was planted in tubes containing ten cc. of Sabouraud's honey broth. The inoculated honey broth tubes were incubated at room temperature in a dark place for thirty days. Controls were prepared with phenol solutions and bacteriostasis was checked in the usual manner. No transfers were made in less than five-minute intervals.

The results showed that in a concentration of one in 500 (distilled water) the ammonium chloride compound destroyed the spores of *B. subtilis* and those of the two types of fungi in 48 hours. The spores of *Trichophyton gypseum* were destroyed by phenol solution 1:120 in five minutes, while the spores of *Mucor* required 48 hours to show evidence of destruction by phenol 1:120. Spores of *B. subtilis* were not destroyed by 5% phenol solution in 24 hours.

SUMMARY AND CONCLUSIONS.

A new chemical compound, alkyl-dimethyl-benzyl-ammonium chloride, has been studied to determine its antiseptic and bacteriostatic properties. The work has been carried out according to methods which are practiced in the laboratories of the Food and Drug Administration. In addition, some methods for which no standard has been adopted, have been applied in order to extend the work. Results may be summarized as follows:

1. Phenol coefficient tests carried out according to the method of the Food and Drug Administration at a medication temperature of 37° C. and 20° C. gave the following results: For *Eberthella typhi* the average was 271 at 37° C., and 176 at 20° C. With addition of serum the figures were 72 and 51, respectively. For *Staphylococcus aureus* at 37° C. the coefficient was 293, and 275 at 20° C. With addition of serum the figures were 154 and 104, respectively. With our strain of *Streptococcus pyogenes* the coefficient at 37° C. was 272 and with serum 129. Three tests with *Escherichia coli* at 37° C. yielded an average coefficient of 318.

The reduction of coefficient values at the lower temperature of medication and in the presence of organic matter is clearly shown and is in accord with similar results, which were obtained with other antiseptic agents. However, even the lower figures prove a high germicidal value. These differences are less in proportion when *Staphylococcus aureus* is the test organism than when *Eberthella typhi* is used.

2. Solutions in 95% ethyl alcohol yielded virtually the same results as were obtained with aqueous solutions. Inasmuch as the method for determining phenol coefficients demands the use of distilled water for preparing the required concentrations, the alcohol content is reduced to a negligible quantity. In high concentrations of alcoholic solutions the effect of the alcohol may prove to be appreciable.

3. A concentration of 1:100,000 still retains inhibitory potency for *Staphylococcus aureus* as shown by the Agar Cup-Plate method. Some inhibition is also apparent in the presence of horse serum in the same concentration. For *Eberthella*

typhi the limit of inhibition is somewhat less than 1:10,000 without serum and somewhat less than 1:5000 with serum.

4. Spores of *Trichophyton gypseum were readily inhibited, which fact was shown in* agar cup-plate tests by the formation of a clear zone of 20 m./m. width without serum and a zone of 14 m./m. when ten per cent serum was added.

5. Solutions in various mixtures of oils, using the spores of *Trichophyton gypseum*, gave clear zones of 4 and 5 mm. width according to the kinds of oil used. This fact demonstrates that solutions in oil may penetrate and inhibit growth of microörganisms. It should be noted in this connection that in agar cup-plate tests the size of the area of inhibition depends not only on activity of the antiseptic, but also on its ability to penetrate the agar jelly.

6. Spores of *Bacillus subtilis* were destroyed in five minutes or less in a concentration of 1 Gm. of the ammonium chloride compound in 500 cc. of aqueous solution.

7. Spores of two types of fungi were destroyed in five minutes or less by the same concentration 1:500.

8. A limited number of tests for disinfecting the human skin demonstrated that ten per cent solution in distilled water or in ethyl alcohol actually destroyed microbial life with no immediate or deferred irritation of the skin observed. Manifestly, this work should be extended in order to determine the exact concentration required to yield satisfactory results.

REFERENCES.

(1) Domagk, *Deut. Med. Wochschr.*, 21, 827 (1935).
(2) U. S. Department of Agriculture *Circular 198.*
(3) *The American Journal of Surgery*, 23, 371 (1934).

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p_H STUDIES OF MILK OF MAGNESIA WITH THE GLASS ELECTRODE.

BY J. A. C. BOWLES* AND E. C. MERRILL.[1]

It has been known for some time that Milk of Magnesia develops an unpleasant taste after standing in ordinary glass bottles for several months. This was thought to be due to the Milk of Magnesia attacking the silicates of the glass causing an increase in hydroxyl ions. Billheimer and Nitardy (1) found that the addition of a small amount of citric acid to Milk of Magnesia yielded a buffer of sufficient capacity to prevent, for a considerable time at least, any objectionable increase in hydroxyl ions. In their investigation they used only Milk of Magnesia made (private communication) by the double decomposition method.

The purpose of this work was (1) to study the change in p_H of Milk of Magnesia made by the direct hydration and double decomposition methods on standing in ordinary glass bottles; (2) to determine the p_H's of Milk of Magnesia made by

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both methods upon the addition of small amounts of citric acid; (3) to see if the p_H of Milk of Magnesia made by both methods and containing small amounts of citric acid changed upon standing in ordinary glass bottles; (4) to study the changes in viscosity of the milks upon the addition of citric acid; (5) to study the permanent effect of heat upon the viscosity of the two milks with and without citric acid present.

The p_H determinations were made at room temperature with a glass electrode and vacuum tube potentiometer. The glass electrode was calibrated each day against several standard buffer solutions.

The viscosity measurements were not only relative but significant. They were made with a MacMichael viscosimeter at room temperature. A standard No. 22 wire and big plumb bob were used. The Milk of Magnesia being tested was added to the 3-cm. mark on the spindle. The speed was 20 r. p. m.

Milk of Magnesia made by both methods and having a p_H of 10.55 was stored for nine months in ordinary glass bottles of different size, shape and color. At the end of nine months the Milk of Magnesia made by direct hydration had a p_H of 10.62, whereas the p_H of the Milk of Magnesia made by double decomposition had increased to 11.2.

Milk of Magnesia made by both methods was treated so that it contained 0.1% citric acid. The p_H was then 10.10. These treated milks were stored for nine months in the same kind of bottles mentioned above. At the end of nine months the p_H's of these milks were again determined, and found to be 10.15. See tabulation of results in Table I.

TABLE I.—CHANGE IN p_H OF MILK OF MAGNESIA ON STANDING IN ORDINARY GLASS BOTTLES.

Length of Time in Bottles (Years).	Milk of Magnesia Direct Hydration.	Milk of Magnesia Direct Hydration (0.1% Citric Acid).	Milk of Magnesia Double Decomposition.	Milk of Magnesia Double Decomposition (0.1% Citric Acid).
..	10.55	10.10	10.55	10.10
0.75	10.62	10.15	11.22	10.15
1.0	...	...	11.42	...
1.5	...	...	11.50	...
2.8	...	...	11.68	...
3.5	...	...	11.75	...

It would seem from the above results that the work of Billheimer and Nitardy (1) on Milk of Magnesia made by the *standard double decomposition method* has been confirmed. However, they did not study the effect of Milk of Magnesia made by the direct hydration process upon ordinary glass bottles. The impression one gets from their conclusions is that magnesium hydroxide is responsible for the attack upon the silicates of ordinary glass bottles resulting in a considerable increase of hydroxyl ions. Our p_H measurements lend no support to this view, because the p_H of Milk of Magnesia made by direct hydration was found not to increase appreciably upon standing in ordinary glass bottles. This work does support their conclusion that 0.1% of citric acid added to Milk of Magnesia made by double decomposition results in a buffer of sufficient capacity to insure against any increase in hydroxyl ions for a considerable time.

While adding solid citric acid to Milk of Magnesia, it was noticed that the viscosity of it was lowered appreciably. This proved to be beneficial in the case of Milk of Magnesia made by direct hydration because the viscosity of this milk tends to increase while in storage. The viscosity of Milk of Magnesia made by direct hydration and containing citric acid does not become constant for quite some time after the addition of the acid; whereas, in the case of Milk of Magnesia

made by double decomposition the viscosity, although lowered with increased amounts of citric acid, becomes constant within an hour or so after the addition. However, what the final viscosities of the milks will be depends upon their original viscosities. Tables II and III are typical examples of the changes in viscosity with time of Milk of Magnesia, which have been made by the double decomposition and direct hydration methods and which contain small amounts of citric acid.

TABLE II.—CHANGE IN VISCOSITY AT ROOM TEMPERATURE OF MILK OF MAGNESIA (DIRECT HYDRATION) CONTAINING SMALL AMOUNTS OF CITRIC ACID.

Time after Addition of Acid (Days).	Viscosity of Milk of Magnesia Containing: 0.00% Citric.	0.02% Citric.	0.05% Citric.	0.08% Citric.	0.10% Citric.	0.15% Citric.	0.20% Citric.
1	57.0	52.0	52.0	49.0	45.0	43.0	33.0
3	58.0	53.0	50.0	46.0	43.0	36.0	..
6	59.0	49.0	47.0	44.0	40.5	32.5	19.5
12	60.0	49.0	46.0	..	40.3	30.0	15.0
25	..	..	45.5	41.0	38.5	..	..
37	63.0	53.0	..	40.0	..	30.0	15.0
51	..	53.0	..	39.0	..	..	..

TABLE III.—CHANGE IN VISCOSITY AT ROOM TEMPERATURE OF MILK OF MAGNESIA (DOUBLE DECOMPOSITION) CONTAINING SMALL AMOUNTS OF CITRIC ACID.

Time after Addition of Acid.	Viscosity of Milk of Magnesia Containing: 0.00% Citric.	0.02% Citric.	0.05% Citric.	0.08% Citric.	0.10% Citric.	0.15% Citric.
1 Hour	39.0	29.0	21.0	19.5	19.0	17.0
1 Day	38.0	29.0	20.0	..	..	..
2 Days	..	..	..	19.5	18.0	16.0
3 Days	39.0	29.0	20.0	..	..	..
5 Days	..	..	..	19.0	18.0	..
8 Days	39.0	30.0	21.0	..	..	..
15 Days	39.0	30.0	20.5	..	..	..

It was thought that by increasing the temperature the viscosity of the milk made by direct hydration and free from citric acid would increase and that containing the acid would decrease. This was found to be true.

The milks were heated to 90° C. in glass-covered pyrex Erlenmeyers. They were weighed at room temperature before and after heating to insure against any loss of water. The viscosity measurements were done at room temperature. A typical example of how the viscosity of a Milk of Magnesia made by direct hydration and free from citric acid increases when heated at the above temperature is the case where the viscosity rose from 72 to 87 after two hours of heating. The maximum viscosity is only attained after several hours of heating.

The lowering of the viscosity by increasing the temperature of a milk containing varying amounts of citric acid is shown in Fig. 1. It is to be noted that the greater the initial concentration of acid, the greater the decrease in viscosity.

Another result, which is considered of interest, was the determination of the p_H's of Milk of Magnesia made by both processes which contained different amounts of citric acid. The results tabulated in Tables IV and V show that the milks made by both methods and varying from 7.5 to 8.0 per cent of magnesium hydroxide had practically the same p_H after the same quantity of citric acid had been added.

TABLE IV.—CHANGE IN p_H AND VISCOSITY OF MILK OF MAGNESIA (DIRECT HYDRATION) AFTER ADDITION OF SMALL AMOUNTS OF CITRIC ACID.

Per Cent Citric Acid.	Milk Assayed 7.52% $Mg(OH)_2$. p_H.	Viscosity.	Milk Assayed 7.97% $MgOH_2$. p_H.	Viscosity.
Plain	10.55	59.0	10.47	52.0
0.02	10.38	53.5	10.35	43.0
0.05	10.22	50.5	10.20	39.0
0.08	10.12	42.5	10.11	34.0
0.10	10.10	39.0	10.07	30.0
0.15	10.02	25.0	10.02	25.0
0.20	...	..	9.95	16.0

TABLE V.—CHANGE IN p_H AND VISCOSITY OF MILK OF MAGNESIA (DOUBLE DECOMPOSITION) AFTER ADDITION OF SMALL AMOUNTS OF CITRIC ACID.

Per Cent Citric Acid.	Milk Assayed 8.02% $Mg(OH)_2$. p_H.	Viscosity.
Plain	10.40	39.0
0.02	10.30	30.0
0.05	10.20	20.5
0.08	10.08	19.0
0.10	10.05	18.0
0.15	10.00	16.0

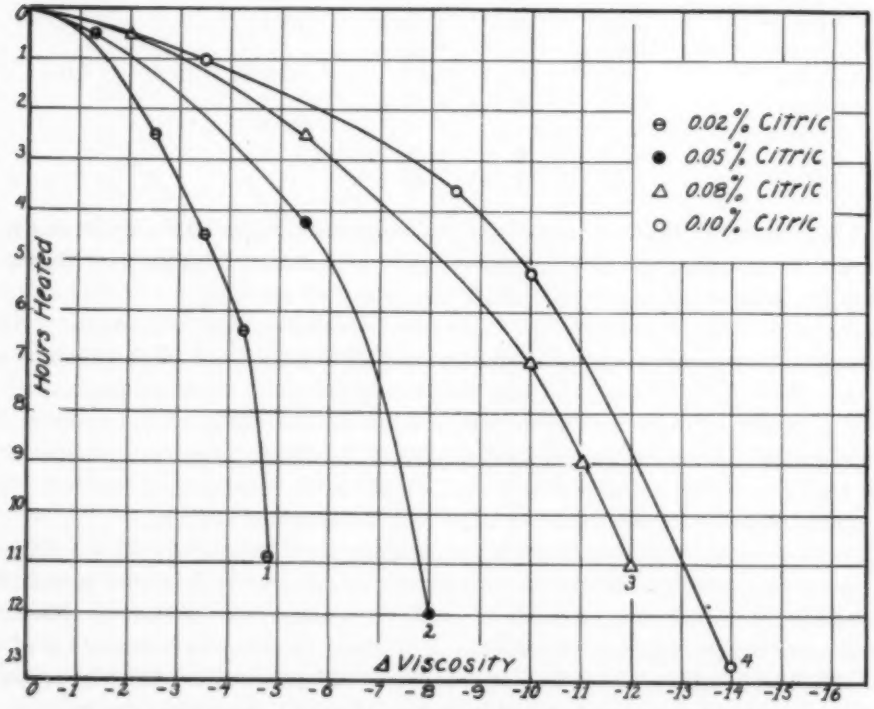

Fig. 1.—Change in viscosity of milk of magnesia (7.52% $Mg(OH)_2$) containing citric acid. Curves 1, 2, 3 and 4 represent milk of magnesia containing 0.02, 0.05, 0.08 and 0.10 per cent citric acid, respectively.

SUMMARY AND CONCLUSIONS.

The p_H studies on Milk of Magnesia made by the standard double decomposition and direct hydration methods have been made with the glass electrode and vacuum tube potentiometer.

The p_H of Milk of Magnesia made by direct hydration and stored in ordinary glass bottles for nine months increased but slightly—about 0.07 p_H.

The p_H of Milk of Magnesia made by the standard double decomposition method and stored in ordinary glass bottles for nine months increased considerably—about 0.6 p_H.

The p_H of Milk of Magnesia made by both methods and containing 0.1% citric acid was 10.10. These milks showed no appreciable change in p_H after standing in ordinary glass bottles for nine months.

The p_H determinations on Milk of Magnesia made by both methods and containing small amounts of citric acid have been made.

The addition of citric acid lowers the viscosity of both milks.

The viscosity of Milk of Magnesia made by direct hydration tends to increase while in storage. Citric acid prevents this.

The viscosity of Milk of Magnesia made by both processes and containing small amounts of citric acid are increasingly lowered by prolonged heating.

ACKNOWLEDGMENT.

We are indebted to E. C. Towle of these laboratories for many helpful suggestions.

REFERENCE.

(1) Billheimer, E. C., and Nitardy, F. W., JOUR. A. PH. A., 25, 36–38 (1936).

AN IMPROVED COLOR TEST FOR VITAMIN A.*

BY A. E. PACINI AND M. H. TARAS.[1]

The Carr-Price reaction which occurs when Vitamin A is added to a saturated solution of $SbCl_3$ has afforded a basis for computing the vitamin A potency of various fish and animal oils. This reaction is not specific for vitamin A, since carotenoids also show the blue coloration and it has the further disadvantage of changing color within thirty seconds. Various substitute tests have been offered among which are the $AsCl_3$-$CHCl_3$ solution (1), $SbCl_3$ plus *o*-dihydroxybenzene in $CHCl_3$ (2), H_2SO_4 (3), trichloracetic acid (4), pyrogallol (5), anhydrous $FeCl_3$ (6), anhydrous $SnCl_4$ (7), anhydrous H_3PO_4 (8), also colors produced by polyphenols and aromatic and heterocyclic amines. Most of the latter produce vague browns, yellows and intermediate shades which might be due solely to oxidation of the yellow colored cod or other fish liver oil (9).

It has been suggested that the color changes produced, especially in the presence of a phenol compound, are the result of a keto-enol rearrangement of the

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phenol (10). It is impossible to state at this time what mechanism causes the color but it is clearly evident that the presence of certain polyhydroxy phenols assists greatly in augmenting color formation. The presence of chlorine in different combinations is seemingly more effective in the production of colors than the individual metal with which it is combined.

The catechol modification of the Carr-Price reaction suggested by Rosenthal and Erdelyi (11) shows a correspondingly deeper color dependent upon the quantity of *o*-dihydroxybenzene used. The resulting violet-red is formed after warming the vitamin-bearing solution with a mixture of *o*-dihydroxybenzene and $SbCl_3$-$CHCl_3$ solution.

We find that vitamin A develops a bright, almost fluorescent, purple with the addition of 1 cc. of $HClO_4$, and 1 drop of guaiacol in $CHCl_3$ solution. This solution develops maximum intensity in 15 seconds and persists two or three minutes allowing ample time to make comparisons. After three minutes the color slowly changes to brown.

A much more stable color is produced when 1 cc. of $HClO_4$, 1 drop of guaiacol[1] and 2 drops of phenol are added to a 5-cc. solution of cod liver oil (3000 A per Gm.) in $CHCl_3$. The color is a brilliant violet. Within a few minutes the color concentrates in the $CHCl_3$ layer and develops to a bright red.

The following table shows various new color reactions produced with vitamin A bearing oils.

TABLE I.

	Reagent.	Cod Liver Oil.	B-Carotene.
1	H_2MoO_4 + $HClO_4$	Light blue to dark blue	Blue green
2	Diphenylamine + $HClO_4$	Purple—fades at once	Dark brown
3	Hydroxylamine + CH_3COCl	+ Phenol ØOH pink	.....
4	$SOCl_2$	Red violet	Yellow
5	$SOCl_2$ + Hydroxylamine	Purple	.....
6	$H_3PO_4.12MoO_3$	+ Phenol ØOH deep blue	Dark green
7	$POCl_3$	Purple	.....
8	CH_3COCl	Violet	.....
9	$POCl_3$ + $ClSO_3H$	Violet	Deep blue to green brown
10	$H_3PO_4.12MoO_3$ + $P_2O_5.12WoO_3.42\ H_2O$	Light green	Medium green
11	$SOCl_2$ + CH_3COCl	Bright red to brown	Yellow color bleached
12	$H_3PO_4.12MoO_3$ + Hydroxylamine	.....	Medium green
13	$POCl_3$ + $SOCl_2$	Purple	Color is bleached
14	Phenolsulfonic + Phenoldisulfonic	Purple—fades rapidly	Green brown
15	$KClO_3$	Violet	.....
16	P_2O_5	Develops light purple	.....
17	P_2O_5 + $POCl_3$	Violet	.....
18	CH_3COCl + $ClSO_3H$	Dark brown	Blue green
19	CH_3COCl + Phenol	Pink	.....
20	$HClO_4$ + Phenol + *p*-dihydroxybenzene	Bright purple to bright red	Purple to red (weak)

[1] A reagent consisting of 8% guaiacol, 17% phenol and 75% $CHCl_3$ can be prepared to facilitate the new test. This mixture keeps for several days. Add an equal volume to the $CHCl_3$ solution of the oil to be tested (usually 1 cc.) and 1 cc. of $HClO_4$.

The suggested improved test[1] has the advantage of not reacting with inactive carotene and not producing the purple color except in the presence of vitamin A. We have tried the reagent with various vegetable and animal oils including hempseed, soy bean, linseed, olive, wheat germ, cocoanut, castor, peanut, herring, lard, hydrogenated shortenings, butter, burbot and cod liver oils. Except in the case of butter, burbot and cod liver oil there was no reaction. Olive oil colored a faint blue but so pale as to be ummistakably negative in A.

SUMMARY.

1. The existing $SbCl_3$-$CHCl_3$ solution has several drawbacks as a vitamin A test since other carotenoids show blue coloration with the reagent. Also the color fades too rapidly to allow for accurate comparison of a series of samples.

2. It is thought that a keto-enol rearrangement of phenol may be a determining factor in producing color changes.

3. The presence of chlorine in certain states seems a decisive factor in producing color reactions.

4. A stable purple color which develops into a bright red is produced when 1 drop of a vitamin A oil is reacted with 1 drop of guaiacol and 2 drops of phenol and 1 cc. of $HClO_4$ in 5 cc. of $CHCl_3$. This color seems specific for vitamin A.

5. Other oils lacking vitamin A do not show this reaction.

REFERENCES.

(1) Rosenheim, O., and Drummond, J. C., *Biochem. J.*, 19, 753 (1925).
(2) Rosenthal, E., and Erdelyi, *Ibid.*, 28, 71 (1934).
(3) Ueno, S., *Ind. & Eng. Chem.*, 7, 598 (1915).
(4) Fearon, W. R., *Biochem. J.*, 19, 888 (1925).
(5) Fearon, W. R., *loc. cit.*
(6) Carr, F. H., and Price, E. A., *Biochem. J.*, 20, 497 (1926).
(7) Carr, F. H., and Price, E. A., *loc. cit.*
(8) Kobayksi and Yamato, *J. Soc. Chem. Ind. Japan*, 27, 1060 (1924).
(9) Hamano, S., *J. Agr. Chem. Soc. Japan*, 4, 1 (1928).
(10) Ueno, S., *J. Soc. Chem. Ind. Japan*, 38, Suppl. Binding 742b.
(11) Rosenthal and Erdelyi, *Biochem. J.*, 28, 71 (1934).

[1] The Rosenthal-Erdelyi modification of the Carr-Price test for Vitamin A is based on the addition of catechol to the antimony trichloride-chloroform solution. The Carr-Price test uses only the $SbCl_3$-$CHCl_3$ solution. The investigation revealed that the latter modification, with the catechol, while producing a more stable color did not produce as quantitative a test as did the simple Carr-Price solution.

The author's modification uses the monomethyl-ether of catechol which seems to develop its color in direct proportion to the vitamin A content.

Carotenoids may be defined as pigments containing carotene in one of its isomeric forms. Since only B-carotene splits to yield vitamin A it is obvious that a colorimetric test *must not* give a positive result with an inactive carotene. Vitamin A is a polymolecular alcohol in the form of a yellow *oil*, not crystalline as is B-carotene.

STABILITY AND TOXICITY OF A COMPLEX SALT OF SILVER CHLORIDE AND THIOUREA.*

BY W. M. LAUTER AND A. M. STAUFF.[1]

During an investigation covering double-compounds of Silver Chloride with Thiourea, it was noted that it was impossible to obtain stable solutions of a complex compound of 1 mol Ag Cl and 5 mols Thiourea.

This compound has been described previously (1) as a stable compound in water.

Ag Cl·CH_4N_2S (2) is only sparsely soluble in water and easily decomposed.

The compound Ag Cl·5CH_4N_2S was prepared as described in German Patent No. 193,661. The preparation was evaporated *in vacuo* in a water-bath of 45° C.–50° C.

Six Gm. Ag Cl·5CH_4N_2S were dissolved in 120 cc. H_2O. A clear solution was obtained which in a few minutes deposited a fine crystalline precipitate. This was filtered, washed with 120 cc. H_2O, followed by 40 cc. of alcohol and by 15 cc. of ether. A residue of 0.76 Gm. remained.

0.4 Gm. was analyzed.—0.1932 Gm. Ag Cl was obtained. Found: 48.3% Ag Cl.
Calculated for Ag Cl·2CH_4N_2S: 48.7% Ag Cl.

The solubility of this salt seemed to be about 0.1% in water. It was found that an addition of a small amount of Thiourea caused immediate solution in a small amount of water.

One mol Ag Cl·5CH_4N_2S was mixed with 1 mol and with 2 mols Thiourea, respectively, and the resultant mixtures dissolved in 10 parts of water. The Ag Cl·6CH_4N_2S compound deposited crystals in a few hours, while the Ag Cl·7CH_4N_2S remained clear.

The toxicity of Thiourea is known to be low, but definite (3). In order to be certain that none of the results of this investigation should be influenced by toxic actions of free Thiourea, a 5% aqueous Thiourea solution was fed to 5 rats by way of a stomach tube.

CHART I.

Rat No.	Weight of Rat in Gm.	Dosage in mg.	5% Thiourea Solution, Cc.	Results.
21	214	107	2.14	Alive, no toxic symptoms
22	152	76	1.52	Alive, no toxic symptoms
23	146	73	1.46	Alive, no toxic symptoms
24	152	76	1.52	Alive, no toxic symptoms
25	102	51	1.02	Alive, no toxic symptoms

This chart shows that 0.5 mg. Thiourea was given per one Gm. of rat weight. This dosage represents a slight excess over the amount of Thiourea contained in the largest dose of Ag Cl·5CH_4N_2S + 2CH_4N_2S employed. This shows that the small additional amount of 2CH_4N_2S is of little influence upon the toxicity of the salt.

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CHART II.

Rat No.	Weight in Gm.	Dosage of Ag Cl·5CH_4N_2S+2C H_4N_2S per 1 Gm. Rat Weight.	Equivalent to Dosage of Ag Cl·5CH_4N_2S per 1 Gm. Rat Weight.	Amount of "Free" 2 mols CH_4N_2S per 1 Gm. Rat Wt.	Given as an Aqueous Solution of	Results.
1	140	0.26	0.20	0.06	2%	Alive, but severe toxic symptoms
2	108	0.26	0.20	0.06	2%	Alive, but severe toxic symptoms
3	156	0.26	0.20	0.06	2%	Alive, but severe toxic symptoms
4	166	0.26	0.20	0.06	2%	Alive, but severe toxic symptoms
5	140	0.26	0.20	0.06	2%	Alive, but severe toxic symptoms
6	142	0.325	0.25	0.075	2½%	Dead after 4 hours
7	178	0.325	0.25	0.075	2½%	Dead after 12 hours
8	150	0.325	0.25	0.075	2½%	Dead after 12 hours
9	200	0.325	0.25	0.075	2½%	Dead after 12 hours
10	175	0.325	0.25	0.075	2½%	Alive, but severe toxic symptoms
11	178	0.39	0.30	0.09	3%	Alive, but severe toxic symptoms
12	136	0.39	0.30	0.09	3%	Dead after 3 hours
13	132	0.39	0.30	0.09	3%	Dead after 1 hour
14	150	0.39	0.30	0.09	3%	Dead after 3 hours
15	142	0.39	0.30	0.09	3%	Dead after 3 hours

This chart indicates that the toxicity for Ag Cl·5CH_4N_2S + 2CH_4N_2S lies between 0.26 and 0.325 mg. per one Gm. rat weight. That would correspond to 0.2 and 0.25 mg. Ag Cl·5CH_4N_2S, provided that this compound remained stable in solution. As shown in the foregoing, this is not the case. It was of interest to determine how a freshly prepared solution of Ag Cl·5CH_4N_2S would differ from one which had 2 mols CH_4N_2S in addition. This was given as a 2½% aqueous solution.

CHART III.

Rat No.	Weight in Gm.	Dosage of Ag Cl·5CH_4N_2S per 1 Gm. Rat Wt.	Results.
16	196	0.25	Alive, but severe toxic symptoms
17	170	0.25	Alive, but severe toxic symptoms
18	152	0.25	Alive, but severe toxic symptoms
19	160	0.25	Dead after 15 hours
20	165	0.25	Alive, but severe toxic symptoms

When compared with rats Nos. 6, 7, 8, 9 and 10 on Chart II, which had received the same dosage plus 2 mols of Thiourea, it is quite possible that the formation of Ag Cl·2 Thiourea might account for the lower toxicity when Ag Cl·5CH_4N_2S is given alone.

The additional toxicity of 0.75 mg. Thiourea per one Gm. rat weight does not seem in itself to be the reason, because as Chart I shows 0.5 mg. Thiourea per one Gm. rat weight showed no visible symptoms of toxicity.

SUMMARY.

The complex salt Ag Cl·5CH_4N_2S was found to be unstable in aqueous solutions due to the formation of Ag Cl·2CH_4N_2S. Ag Cl·7CH_4N_2S was found to be

very stable in aqueous solutions. The toxicity of the latter compound is about 0.3 mg. per one Gm. rat.

REFERENCES.

(1) Ger. Patent No. 193,661.
(2) Reynolds, *J. Chem. Soc.*, 61, 253 (1891).
(3) Sollman, Manual of Pharmacology, 1936, page 743.

SULFOMORPHID; AND THE PURPLE FLUORESCENCE TEST, A NEW DERIVATIVE TEST FOR MORPHINE.*

BY CHARLES C. FULTON.[1]

The product resulting from heating morphine in sulfuric acid was known to the early students of morphine chemistry as "sulphomorphid." Perhaps they had noted the loss of amine properties, and assumed that the nitrogen had in some way gone to the amide form. What actually happens (in addition to dehydration) is doubtless sulfonation, with formation of an inner salt (1). Modern texts either say nothing about the specific action of sulfuric acid, or, apparently losing sight of the actual nature of the usual product, say that apomorphine is formed. There probably is partial conversion to apomorphine with *diluted* sulfuric acid (5 plus 3, for example), but with the usual concentrated acid *no* apomorphine is formed under any circumstances.

True enough, the product may be regarded as a derivative of apomorphine, as well as a derivative of morphine. The derivative first formed with concentrated acid, at temperatures below 60° C., is probably identical with apomorphine-sulfonic-acid, as obtained and described by Kitasato and Goto (1, 2). But this is not apomorphine, any more than sulfanilic acid is aniline. Nor is there anything to indicate that apomorphine is formed first and then sulfonated. On the contrary, sulfonation, with formation of an inner salt, probably occurs first, almost coincident with solution; but dehydration begins simultaneously, and it is difficult, if not impossible, to separate these effects. Without any heating, at room temperature or even below, the transformation begins at once in concentrated acid; it is made complete within a few minutes by warming to 40–50° C. (3). As the acid is diluted its power to dehydrate seems to outlast, for a time, and to some extent, its power to sulfonate, so that a partial conversion to apomorphine, as appears from qualitative tests, may be obtained by heating. However, the unqualified assertion of many texts, that apomorphine is the resultant product, is little better than entirely erroneous, particularly as concentrated sulfuric acid seems to be the reagent meant.

OBTAINING INSOLUBLE CRYSTALLINE SULFOMORPHID.

Place some dry morphine or its salt in a dry test-tube; dissolve in a little pure concentrated sulfuric acid, taking care to get all the morphine in the tube into solution. Stand in a beaker of water at about 40° C. for 7 or 8 minutes. Dilute with 1 cc. water for every 0.1 cc. sulfuric acid.

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Cool the diluted solution. Test a few drops with Wagner's and Mayer's reagents and phosphomolybdic acid. These and similar reagents give no precipitate. Let the solution stand an hour or longer; if necessary cool with ice and rub the inside of the tube to induce crystallization. A crystalline precipitate forms; it is white, and under the microscope is seen to consist of needles or transparent rods, often in rosettes. These crystals are easily obtained from 1 mg. of morphine, treated as described.

The time for warming stated is close to the optimum, but anywhere from 4 to 20 minutes at 40° will do. At 20°, the same change takes close to 45 minutes at least, with 1 to 2 hours to be preferred.

COLOR REACTIONS.

If sufficient precipitate is obtained, it can be filtered, washed with a little cold water and dried. The color reactions of the product are like those of apomorphine, with some differences, notably in the solubilities of the oxidation product.

HNO_3—red-purple, changing to red, then to orange.
Froehde's reagent—green.
Flückiger's reagent—red.
Marquis' reagent—purple changing to very dark green.

In the presence of chloride, concentrated sulfuric acid containing arsenate produces a beautiful purple, soon changing to dark green.

Very characteristic reactions are the fluorescence developed by ammonia, the colors of the oxidation product, and the ortho-diphenol colors obtained with a little iron; however, these tests are easily obtained without any necessity of isolating the derivative.

INSOLUBLE SULFOMORPHID.

Summarizing, this compound is:

(*a*) Not very soluble in cold water or cold dilute acid, crystallizing out in white, microscopically transparent needles or prisms; quite soluble in alkali, ammonia or Na_2CO_3 solution;

(*b*) Unlike apomorphine in that it does not precipitate with alkaloidal reagents;

(*c*) Like apomorphine in being an ortho-diphenol, and in giving similar, though not identical color reactions.

SOLUBLE SULFOMORPHID.

If the solution in concentrated sulfuric acid is heated further, a new change begins at 60–70° C., and is complete with heating to about 90°. The compound no longer crystallizes out of cold dilute acid, and some differences in the color reactions also signalize the change, which is probably a further sulfonation. This second product is the one known, in solution at least, to the earlier chemists, and which they named "sulphomorphid;" despite that the formula they attributed to it corresponded to apomorphine sulfate and not to a sulfonic acid. When they referred Husemann's test, and other reactions for which such treatment was prescribed as heating the morphine in concentrated sulfuric acid at 100° for half an hour, to "sulphomorphid," there can be no doubt as to the compound actually meant.

Soluble sulfomorphid is also formed by increasing the time of treatment, instead

of the temperature. Standing over night at 20°, or warming an hour or more at 40°, in concentrated acid, effects complete conversion to this compound.

When conversion is made by raising the temperature steadily, the compound undergoes no further change until about 140° is reached, when the solution becomes dark olive-green.

CODEINE AND DIONINE.

Codeine is changed similarly to morphine, only the derivative first formed (sulfocodid or apocodeine-sulfonic acid) is a monophenol, since the methyl group is not displaced by heating to 50°. With continued heating there is a change at 60–70° corresponding to the morphine change at the same temperature; then there is a further change at about 100° which consists in the loss of the methyl group. Thereafter the codeine and morphine reactions are the same.

Dionine reacts like codeine, save that it begins to lose the ethyl group at about 70° instead of 100°; with heating above 80° it reacts the same as morphine.

THE PURPLE FLUORESCENCE TEST FOR MORPHINE.

Dissolve a little dry morphine or its salt in a test-tube in 0.5 cc. of pure concentrated sulfuric acid. Warm in a water-bath at 40° C. for about 7 or 8 minutes. Dilute with 5 cc. water, then add 6 cc. of concentrated ammonium hydroxide, and mix. Do not cool. The solution becomes brown, and gradually a strong and beautiful purple fluorescence develops, very conspicuous on looking obliquely down the tube against a dark background. This fluorescence is noticeable within a few minutes with the optimum amount of morphine, about half a milligram, but it requires at least two or three hours to develop fully, when the tube stands at room temperature. Warming at 40–60° will hasten its development somewhat. With standing over night, or warming for an hour or so, fluorescence is perceptible in the test made with 0.025 mg. of morphine, and could hardly be missed with 0.05 mg. The developed fluorescence remains on dilution with water, and is permanent. In great dilution it finally appears bluish in a nearly colorless solution.

The test, with the quantities of reagents, etc., as given, will yield a much better fluorescence with an ordinary small amount of morphine, 0.1 to 1 mg., than with a larger amount. This will occasion little difficulty, as the order of sensitivity of this test is the same as Pellagri's and other related tests, and the amount of morphine that will normally be taken for such a sensitive test will give close to the maximum reaction. About 0.5 mg. is recommended.

Codeine, treated as above described, shows a little bluish fluorescence in a greenish yellow solution; but this reaction is quite weak, does not resemble the morphine test, and can hardly be considered a test. Pseudomorphine, so far as observed, gives no fluorescence. Apomorphine as such gives no fluorescence; being insoluble in ammonia it collects as a brown precipitate. However, apomorphine after warming in sulfuric acid solution, treated, that is, the same as morphine, gives the test like morphine. Heroine, of course, also gives this test.

SUMMARY.

1. The crystalline derivative of morphine, discovered by the writer (3), which is formed by warming the morphine in concentrated sulfuric acid at about 40° C.,

is probably identical with apomorphine-sulfonic-acid as prepared and described by Kitasato and Goto (1, 2).

2. With further heating in the concentrated acid the compound undergoes another change, probably a further sulfonation. This second compound is the "sulphomorphid" of early investigators of morphine chemistry.

3. A new derivative test for morphine is given, the purple fluorescence test, which is based on conversion of the morphine to insoluble sulfomorphid (apomorphine-sulfonic-acid).

REFERENCES.

(1) *Chemical Abstracts*, 25, 1532 (1931); Zenjiro Kitasato and Kakuji Goto, "Sulfonation of Alkaloids," *Ber.*, 63B, 2696 (1930).

(2) Small, Lyndon F., and Lutz, Robert E., "Chemistry of the Opium Alkaloids," Public Health Service, U. S. Treasury Department, 1932. (Citing Kitasato and Goto.)

(3) Fulton, Charles C., "Some New and Improved Tests for Morphine and Related Alkaloids," *J. Lab. Clin. Med.*, 13, 8, 750 (1928).

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A COMPARATIVE STUDY OF THE ANTISEPTIC PROPERTIES OF CERTAIN OINTMENTS EMPLOYING VARIOUS BASES.*,[1]

BY WILLIAM A. PROUT[2] AND MAE STRICKLAND.[3]

Reddish and Wales (1) investigated twelve of the U. S. P. and fourteen of the N. F. ointments which are generally indicated in conditions demanding an antiseptic action, and found only five of the U. S. P. and six of the N. F. to show any antiseptic properties.

Antiseptic ointments are those ointments which, when in contact with an infected area for a long period of time, either kill the infective organisms, or prevent their further growth. If the antiseptic ointment does not kill but does prevent the growth of the micro-organisms in the infected area, it will not only prevent them from doing further damage but will render them easy prey to the leucocytes. Therefore, this investigation is not concerned with the bactericidal but rather with the bacteriostatic action of the antiseptic. It is pointed out by Reddish (2) that in the treatment of infected surfaces, it is necessary that the active ingredient of the ointment be released from the inert base in order that it may surround the microörganism, thereby inhibiting its activity. Should the antiseptic be so securely incorporated into the inert base that it cannot be released, the therapeutic value of such preparations so far as the antiseptic ingredients are concerned would be worthless. With this idea in mind, this investigation was undertaken in an attempt to determine whether or not such antiseptic medicaments are influenced by the substitution of different fatty and non-fatty bases, and, if so, to what degree.

A series of tests was made, utilizing the more commonly employed so-called "antiseptic ointments" official in the United States Pharmacopœia and in the National Formulary, substituting various fatty and non-fatty bases.

EXPERIMENTAL PROCEDURE.

Staphylococcus (pyrogenes) aureus (3) has been recommended as the test organism for antiseptics and disinfectants. Since this organism is found on the surface of the skin, as well as in abscesses, boils and carbuncles, it was selected as the test organism in this investigation.

In order to simulate as nearly as possible the conditions met in treating infected areas of the skin, plain nutrient agar recommended by Reddish (4) was utilized. A fresh strain of *Staphylococcus aureus* was isolated from a carbuncle of a patient in the Roper Hospital of Charleston. Before each series of tests was made, the organism was transferred into nutrient broth, incubated for twenty-four hours and its phenol coefficient determined by the Food and Drug Administration Method (5). To make reasonably sure of the organism conforming to the phenol resistance requirements (6), a fresh transfer was made from the stock culture each thirty days, and the test organism taken from the month-old stock culture.

Two methods were used throughout the investigation, the Agar Cup-Plate Method (7) with certain modifications and the Agar Plate Method (8). For the Agar Cup-Plate Method, twenty cubic centimeters of plain agar were melted and cooled to 40° C. To this was added 0.1 cc. of a 24-hour broth culture of *Staphylococcus aureus*. This was thoroughly mixed, poured into a Petri dish and allowed to harden at room temperature. By means of a sterile cork borer, a disc

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* Section on Practical Pharmacy and Dispensing, A. PH. A., Dallas meeting, 1936.

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[3] Instructor in Bacteriology, School of Medicine.

was cut out of the solidified agar, leaving a cup 1.5 cm. in diameter and of an approximate depth of 0.2 cm., which was large enough to hold the sample of ointment to be tested. By means of a sterile pipette, a few drops of melted agar were placed in the cup to seal the crevices so as to prevent the ointment from seeping under the agar. An accurately weighed sample (500 mg.) of ointment was molded in the cork borer and transferred to the cup with the aid of a plunger, made from a cork to fit the borer. This modification is unique and facilitates the handling of the ointment. Ointments of a soft consistency cannot, of course, be molded, but may be transferred directly to the cup from the weighing paper. The plates were then covered with porous clay tops which absorbed the water of condensation, incubated at 37° C. for 24 hours, and then examined for evidence of inhibition. If a clear zone appeared around the ointment, the ointment was declared to possess inhibitory properties. The width of the zones was measured with a millimeter rule under a hand lens. All tests were made in duplicate and were rechecked many times. The Agar Plate Method is similar in all respects to the Agar Cup-Plate Method, with the exception that the ointment is placed directly on the surface of the inoculated agar.

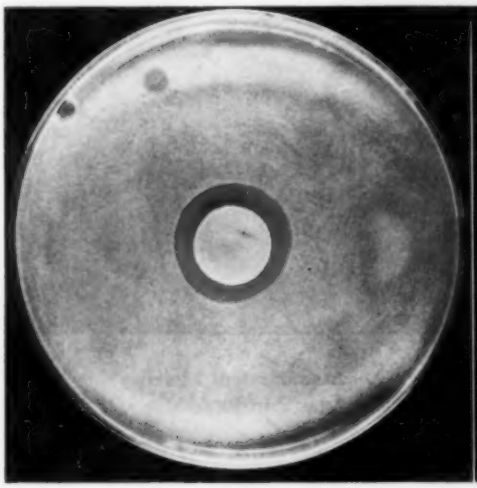

Fig. 1.—Yellow Mercuric Oxide Ointment, U. S. P. X. Agar Cup-Plate Method, 4-mm. zone.

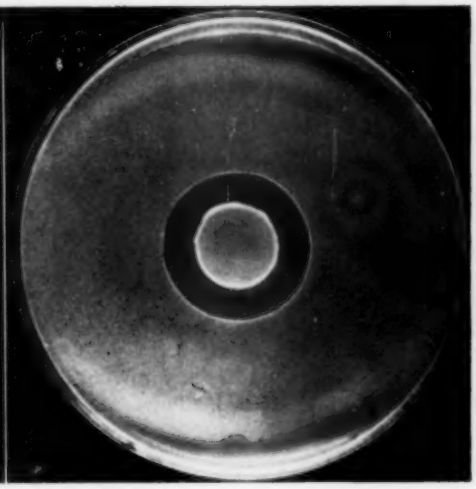

Fig. 2.—Ammoniated Mercury Ointment, U. S. P. XI. Agar Cup-Plate Method, 6-mm. zone.

YELLOW MERCURIC OXIDE OINTMENTS.

Bases.	Bacteriostatic Efficiency, Width of Zone of Inhibition Measured in Millimeters. Agar Cup-Plate Method.	Agar Plate Method.
U. S. P. XI	5 mm.	4 mm.
U. S. P. X (Fig. 1)	4 mm.	4 mm.
Wool Fat	5 mm.	4 mm.
Hydrous Wool Fat	5 mm.	5 mm.
Petrolatum	1 mm.	–
White Petrolatum	5 mm.	6 mm.
Rose Water Ointment	6 mm.	5 mm.
Protegin X*	5 mm.	5 mm.
Hydrogenated Fat[1]	7 mm.	6 mm.

IODINE OINTMENTS.

Bases.	Bacteriostatic Efficiency, Width of Zone of Inhibition Measured in Millimeters. Agar Cup-Plate Method.	Agar Plate Method.
U. S. P. XI (Fig. 5)	11 mm.	10 mm.
U. S. P. X	9 mm.	7 mm.
Wool Fat	6 mm.	5 mm.
Hydrous Wool Fat	5 mm.	6 mm.
Petrolatum	2 mm.	1 mm.
White Petrolatum	2 mm.	2 mm.
Rose Water Ointment	7 mm.	7 mm.
Protegin X*	9 mm.	9 mm.
Hydrogenated Fat[1]	12 mm.	15 mm.

– No zone.

* Product of the Goldschmidt Corporation, New York.

[1] Crisco, a product of Procter and Gamble, Cincinnati.

All conditions for carrying out the tests, including the manufacture of the ointments which were prepared to meet the pharmacopœial and National Formulary standards as to purity and strength, and the procedure for preparing the plates for incubation, were kept uniformly consistent throughout the entire investigation. Only chemically pure ingredients of known strength were used. The bases employed, minus the antiseptic, were plated as controls, and none were found to exhibit inhibitory properties.

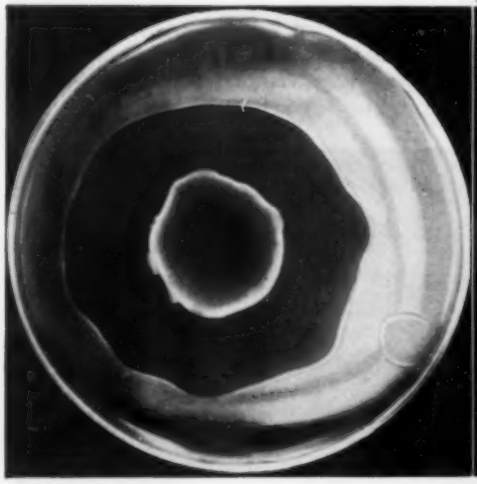

Fig. 3.—Ammoniated Mercury in Wool Fat Base. Agar Plate Method, 13-mm. zone.

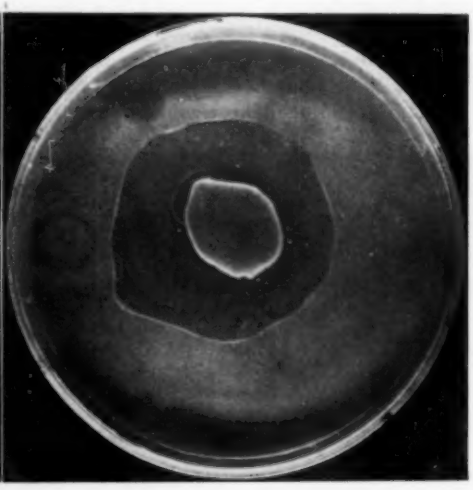

Fig. 4.—Ammoniated Mercury in Wool Fat Base. Agar Cup-Plate Method, 10-mm. zone.

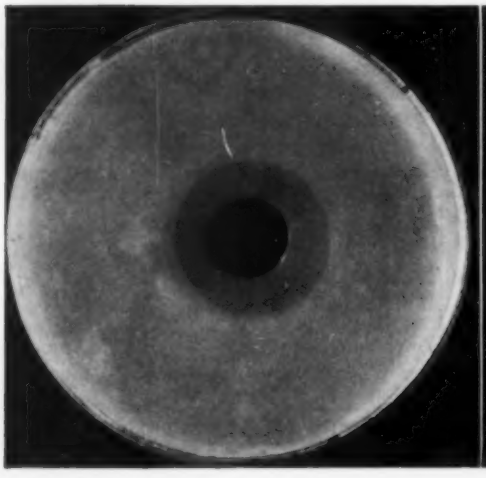

Fig. 5.—Iodine Ointment, U. S. P. XI. Agar Cup-Plate Method, 11-mm. zone.

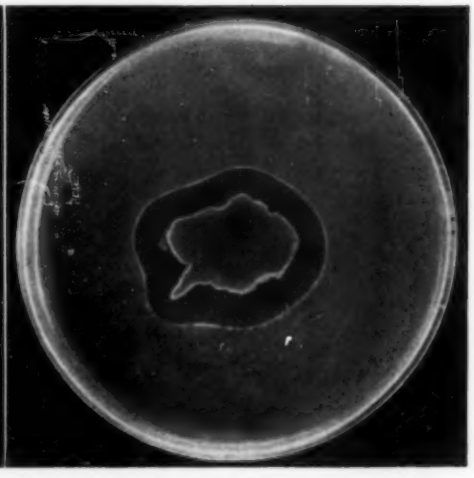

Fig. 6.—Ointment of Red Mercuric Oxide, N. F. VI. Agar Plate Method, 4-mm. zone.

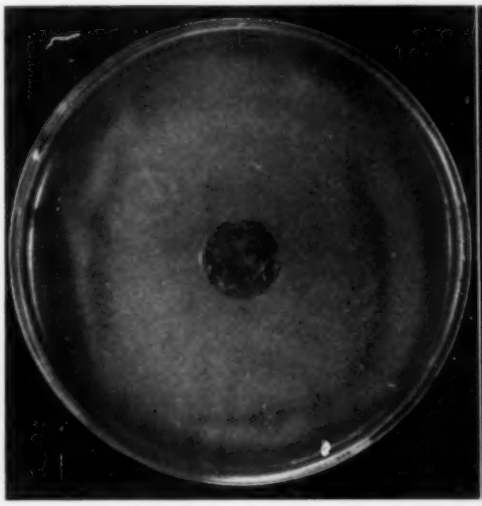

Fig. 7.—Phenol Ointment, U. S. P. XI. Agar Cup-Plate Method. No zone.

Fig. 8.—Sulfur Ointment, U. S. P. XI. Agar Cup-Plate Method. No zone.

AMMONIATED MERCURY OINTMENTS.

Bases.	Bacteriostatic Efficiency, Width of Zone of Inhibition Measured in Millimeters. Agar Cup-Plate Method.	Agar Plate Method.
U. S. P. XI (Fig. 2)	6 mm.	6 mm.
U. S. P. X	9 mm.	7 mm.
Wool Fat	10 mm.	13 mm.
Hydrous Wool Fat	10 mm.	10 mm.
Petrolatum	6 mm.	5 mm.
White Petrolatum	7 mm.	6 mm.
Rose Water Ointment	8 mm.	6 mm.
Protegin X*	8 mm.	8 mm.
Hydrogenated Fat[1]	7 mm.	6 mm.

OINTMENTS OF RED MERCURIC OXIDE.

Bases.	Bacteriostatic Efficiency, Width of Zone of Inhibition Measured in Millimeters. Agar Cup-Plate Method.	Agar Plate Method.
N. F. VI (Fig. 6)	4 mm.	4 mm.
N. F. V	5 mm.	4 mm.
Wool Fat	7 mm.	8 mm.
Hydrous Wool Fat	5 mm.	3 mm.
Petrolatum	5 mm.	4 mm.
White Petrolatum	6 mm.	4 mm.
Rose Water Ointment	11 mm.	8 mm.
Protegin X*	4 mm.	4 mm.
Hydrogenated Fat[1]	5 mm.	4 mm.

OINTMENTS OF MILD MERCUROUS CHLORIDE.

Bases.	Bacteriostatic Efficiency, Width of Zone of Inhibition Measured in Millimeters. Agar Cup-Plate Method.	Agar Plate Method.
N. F. VI	3 mm.	3 mm.
N. F. V	4 mm.	4 mm.
Wool Fat	3 mm.	4 mm.
Hydrous Wool Fat	2 mm.	2 mm.
Petrolatum	2 mm.	2 mm.
White Petrolatum	4 mm.	4 mm.
Rose Water Ointment	5 mm.	6 mm.
Protegin X*	5 mm.	3 mm.
Hydrogenated Fat[1]	5 mm.	4 mm.

PINE TAR OINTMENTS.

Bases.	Bacteriostatic Efficiency, Width of Zone of Inhibition Measured in Millimeters. Agar Cup-Plate Method.	Agar Plate Method.
U. S. P. XI	7 mm.	7 mm.
U. S. P. X	7 mm.	7 mm.
Wool Fat	3 mm.	2 mm.
Hydrous Wool Fat	5 mm.	4 mm.
Petrolatum	3 mm.	3 mm.
White Petrolatum	5 mm.	4 mm.
Rose Water Ointment	6 mm.	6 mm.
Protegin X*	4 mm.	3 mm.
Hydrogenated Fat[1]	2 mm.	1 mm.

* Product of the Goldschmidt Corporation, New York.

[1] Crisco, a product of Procter and Gamble, Cincinnati.

	Bases.	Bacteriostatic Efficiency, Width of Zone of Inhibition Measured in Millimeters. Agar Cup-Plate Method.	Agar Plate Method.
(1) Sulfur Ointments (2) Calamine Ointments (3) Phenol Ointments (4) Chrysarobin Ointments (5) Boric Acid Ointments (6) Zinc Oxide Ointments	U. S. P. XI	–	–
	U. S. P. X	–	–
	Wool Fat	–	–
	Hydrous Wool Fat	–	–
	Petrolatum	–	–
	White Petrolatum	–	–
	Rose Water Ointment	–	–
	Protegin X*	–	–
	Hydrogenated Fat[1]	–	–

– No zone.

* Product of the Goldschmidt Corporation, New York.

[1] Crisco, a product of Procter and Gamble, Cincinnati.

SUMMARY.

1. Six antiseptics (boric acid, calamine, chrysarobin, phenol, sulfur and zinc oxide) exhibited no bacteriostatic properties when combined with the bases employed in this investigation.

2. The tests, in most cases, proved conclusively that the antiseptics when combined with fatty bases, such as the wool fats, hydrogenated fats, etc., exhibit greater bacteriostatic properties than when combined with the non-fatty bases.

3. In the non-fatty group of bases, white petrolatum seems to permit the diffusion of the antiseptic agent into the agar to a much greater extent than petrolatum.

4. Contrary to Reddish's results (9), Calamine Ointment, U. S. P. X and calamine in combination with the bases used, produced no zones of inhibition.

5. Although it has been felt that not enough surface of the inoculated agar might be exposed to the ointment when using the Agar Cup-Plate method, the results showed in this work little or no variation when using either the Agar Cup-Plate or Agar Plate method.

6. It was found that a more accurate measurement of the zones could be made when using the Agar Cup-Plate method, as the margin of the zones produced was more regular.

REFERENCES.

(1) Reddish, Geo. F., and Wales, H. J., JOUR. A. PH. A., 18, 576 (1929).
(2) Reddish, Geo. F., *Ibid.*, 16, 655 (1927).
(3) *Circular 198*, U. S. Department of Agriculture, 9 (1931).
(4) *Ibid.*, 4 (1931).
(5) *Ibid.*, 4 (1931).
(6) *Ibid.*, 4 (1931).
(7) *Ibid.*, 14 (1931).
(8) *Ibid.*, 12 (1931).
(9) Reddish, Geo. F., and Wales, H. J., JOUR. A. PH. A., 18, 576 (1929).

According to James C. Munch, after reviewing various methods of measuring precision, a formula is developed to show how many animals are required for use in bioassaying products to give a desired degree of confidence in the results obtained.—Scientific Section, A. PH. A.

A COMPARISON OF DRUGS AND PHARMACEUTICAL PREPARATIONS USED IN 1880 AND 1930.*,[1]

BY WILLIAM M. FLEMING AND RALPH W. CLARK.[2]

The object of this paper is to make a comparison of drugs and pharmaceutical preparations used in 1880 and 1930. It takes up those products official in the United States Pharmacopœias of 1880, 6th revision, and 1930, 11th revision, and those preparations manufactured by Parke, Davis & Company in 1883 and 1934—1935.[3] Hereafter the United States Pharmacopœias will be abbreviated as U. S. P. VI and U. S. P. XI.

In the tabulation of products official in the U. S. P. VI and U. S. P. XI, as well as in the price books of Parke, Davis & Company for corresponding years, many interesting observations can be made. No attempt is made in this discussion to point out all changes indicated by the tabulations, but only those which are outstanding. Many others may easily be noted from the tabulations themselves, which are too long to be presented here.

Abstracts appeared in the U. S. P. VI in eleven different products, and were cast aside entirely in the U. S. P. XI. On the other hand, such organic synthetic preparations as acetanilid, acetone, chloroform and chlorobutanol and many others are found in the more recent U. S. P. but were absent in the earlier U. S. P. Acetylsalicylic acid, a product well-known to every one to-day, was missing from the U. S. P. VI.

Three antitoxins, three barbiturates, ephedrine, epinephrine and saccharin are some of the pharmaceutical products of the U. S. P. XI which had not gained sufficient prominence or recognition when the U. S. P. VI was being prepared to be included in it.

In general, it may be said that representatives in various modes of administration have been decreased as far as official recognition is concerned over the period of fifty years, and some forms have completely disappeared.

Plasters were represented a half century ago by seventeen separate items, while the U. S. P. XI includes only four; extracts dropped from thirty-two preparations to twelve official to-day; seventy-nine fluidextracts were official in the 1880 revision and only eleven are official now; iron compounds numbered twenty-three, while now only five remain; liniments dropped from ten to four in number and specific infusions have been completely omitted from the U. S. P. XI. The five lithium products of the U. S. P. VI are now unofficial; mixtures appeared officially eleven times in 1880, while now only two are official; oleoresins lost five items leaving only one, and pills which were official in 1880 as fifteen different preparations, now are only official as two. Syrups dropped from thirty-four prepara-

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[1] Part of a thesis submitted in partial fulfilment of the requirements for the degree of Bachelor of Science, University of Wisconsin.

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[3] We wish to express our appreciation to Mr. John P. Rocca, of Madison, Wisconsin, local representative of Parke, Davis & Company, and to the Company for kindly furnishing us with an 1883 catalog of Parke, Davis & Company.

tions in the U. S. P. VI to fourteen in the U. S. P. XI, and tinctures lost forty-three products between 1880 and 1930, leaving thirty now official. Troches are extinct as official preparations but appeared sixteen times officially in 1880. Official ointments have decreased ten in number to the present sixteen and the fourteen wines of the U. S. P. VI are now unofficial. On the other hand, toxins, antitoxins, serums, emulsions and tablets have all become official since 1880.

Approximately ten per cent of the preparations which were official in the U. S. P. VI have found their way to the National Formulary, 6th edition, and thirty-one per cent of the products which were official then are still found in the U. S. P. XI. The number of drugs and preparations in the U. S. P. VI has been decreased in the U. S. P. XI by nearly fifty per cent. Approximately thirty-two per cent of the official products in the earlier book have been declared of not sufficient value or pharmaceutical usefulness to be official. Two hundred and fifty-four new products have become official in the U. S. P. in the interim between 1880 and 1930.

In comparing products, both official and not official, but manufactured by commercial houses, a tabulation was made showing the types of preparations, with the respective number of preparations of each class, made in 1883 as against those of 1934–1935, as the nearest corresponding dates when catalogs were available. This tabulation tends to show the trend in use of various types of pharmaceutical products. The products of Parke, Davis & Company were used for this study as this was one of the largest pharmaceutical houses in the United States in 1880 and consequently its products would show the most accurate comparison of these products over the fifty-year period.

In 1883, Parke, Davis & Company manufactured sixty-seven concentrations and to-day only six. Medicinal elixirs have dropped from 147 to seventy-two, and fluidextracts underwent a landslide from 503 products in 1883 to 140 at present. Solid extracts dropped from 117 down to only ten, which are marketed to-day. The Parke, Davis & Company catalog of 1883 showed a stock of 379 herbs, leaves, barks and flowers, while the 1934–1935 catalog lists only thirty-six. In 1883, this Company manufactured no liniments, emplets, solutions, spirits or mixtures. The earlier list of pills included 571 varieties, while to-day it numbers only 103. Tablets were not manufactured by the Company in 1883, but 502 different ones are listed in the more recent catalog. Medicinal wines dropped from twenty-two to four at present, and lozenges from eighty-two to nine. Eighty-three different granules were listed in 1883, while now they are entirely absent from the price list. The 1883 catalog also showed fourteen other classifications which are absent from the new edition; among them such modes of administration as oleates, plasters, glyceroles and cerates; on the other hand, the new edition shows such preparations as diagnostic extracts, biologicals, laboratory diagnostic agents, protein extracts and phylacogens, which were foreign to the early catalog.

Parke, Davis & Company listed somewhat over 2500 different products in the catalog of 1883. The present list has been reduced to slightly over 2000 products. However, only about one-third of the originals are manufactured to-day, which means that the market has been supplied with newer products just about as fast as the old ones became obsolete.

Another interesting approach in the comparison of these Parke, Davis &

Company products is from the price angle, which on the whole indicates a general rise in prices, some definitely more abruptly so than others.

Three classes of preparations were selected for this comparison which were in considerable demand in 1883 and have remained so through 1934–1935, so that a fair comparison could be made. Tinctures, medicinal syrups and powdered extracts are the three classes compared. The tabulation also shows products dropped in these classes and new ones added in the course of the fifty-year period. There were sixteen powdered extracts, fourteen medicinal syrups and six tinctures that survived the half century of manufacturing.

Powdered extracts that have more than doubled in price since 1883 are as follows (the prices figured per ounce): Colocynth compound, 30 cents to 70 cents; digitalis, 40 cents to $1.20; ergot, 80 cents to $2.00; hydrastis, 50 cents to $3.50; hyoscyamus, 45 cents to $1.00; opium, $2.00 to $10.00; and valerian, 40 cents to $1.20. Ox gall remained at 45 cents per ounce during the entire period.

Among the syrups that underwent a considerable price change are (prices figured per gallon): Calcium iodide, $9.00 to $24.00; Dover's powder, $9.00 to $16.00; ipecac, $5.50 to $12.00; rhubarb and potassium compound, $7.00 to $23.20; sarsaparilla, $4.50 to $12.00; and squill compound, $5.50 to $12.00. However, syrup of calcium lactophosphate remained at $8.00 for the fifty years, and syrup of wild cherry did the unusual by dropping in price from $5.50 to $2.50 per gallon.

The bromides, mentholated compounds and white pine preparations are all known and largely used syrups that were not included in the 1883 price catalog.

Tinctures, the third class of Parke, Davis & Company preparations compared in this manner, show probably the most regular ascension in price, with very few abrupt or outstanding rises. In fact, five of the six tinctures that were marketed both in 1883 and 1934–1935 were priced at $2.50 per pint and the sixth preparation, Warburg's tincture, showed one of the only two decreases in price of all those products compared in the three classes, by going from $5.50 in 1883 to $3.80 in 1934–1935. The greatest fluctuation in price was evidenced in tincture of digitalis, which sold for $2.25 per pint in 1883 and rose to $3.40 per pint in 1934–1935. The tinctures show a definite increase in number listed now over those manufactured in 1883.

In a general examination of this work, two particularly outstanding factors are brought to light, the first being that prices for pharmaceutical preparations have, on the average, doubled, and that approximately two-thirds of the products in use in 1883 have now become obsolete as far as manufacture or use is concerned. This latter fact was indicated in both the survey of official preparations and those manufactured by Parke, Davis & Company.

It was interesting to note that the survey of the Parke, Davis & Company products listed in the catalog of 1883 and 1934–1935 showed to be about the same, but that approximately two-thirds of the original drugs or pharmaceutical preparations that have been abandoned have been replaced by new preparations, which means that pharmaceutical research, publicity and demand have, in the last fifty years, played an important rôle in human medication.

MONOPOLY AND COMPETITION IN TRADE-MARKED ARTICLES.*

BY B. OLIVE COLE.[1]

In discussing trade-marks one should consider the economic concepts concerning monopoly and competition, standards of legality, property rights acquired in trade-marked articles, as well as remedies and procedure to protect these rights and the rights of the public. There has been an increasing recognition of studying the underlying economic and social aspects of the many phases of trade. As early as 1897, Mr. Justice Holmes said:

> "I look forward to a time when the part played by history in the explanation of dogma shall be very small, and instead of ingenious research we shall spend our energy on a study of the ends sought to be attained and the reasons for desiring them."

In considering the economic concepts of monopoly and competition, it should be borne in mind that it was not until the nineteenth century that the English common law definitely fostered a system of competitive individualism. It required centuries and the accelerating force of an Industrial Revolution to make the transition from a regimented guild system, the oppression of monopolistic grants and the restrictions of the area of mercantilism to the establishment of the *Laissez Faire* policy under which competition was considered the regulator of industrial life. One need only to review the history of the enactment of the Interstate Commerce Act of 1887 and the Sherman Anti-Trust Act of 1890, together with the state anti-trust legislation of that era, to realize that all of these were intended to preserve the competitive system in industry and prevent the encroachments of monopoly. Remedy by civil action was granted to any person injured in his business or property through monopoly, and provision was made for the dissolution of the monopoly by injunctive process. No effort was made to safeguard the competitive economic processes against the abuses of business conduct which frequently lead to its subversion. These laws aimed to eliminate restraint of trade and monopoly through the enforcement of competition rather than through regulation.

And to-day we are seemingly suffering from too much competition, and are turning again to regimentation and restrictions, with the hope of control through the passage of laws and the administrative supervision of unfair methods of competition. We have come to a realization with regard to competitive practices that though, generally speaking, it is to the interest of every individual member of the community that he should be free to earn his livelihood in any lawful manner, and the interest of the community that every individual should have his freedom, yet under certain circumstances it may be to the interest of the individual to contract in restraint of this freedom, and the community if interested to maintain freedom of trade, is equally interested in maintaining freedom of contract within reasonable limits. The public policy toward these rights and restrictions was demonstrated by the establishment of the Federal Trade Commission in 1914, which was launched as an administrative agency for the enforcement in the public interest of a statutory prescription against unfair methods of competition. The

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economic work assigned to the Federal Trade Commission was to gather and compile information concerning, and to investigate from time to time, the organization, business, conduct, practices and management of any corporation engaged in commerce (excepting banks and common carriers), and its relations to other corporations and to individuals, associations and partnerships.

Predicating our discussion upon the foregoing economic concepts concerning monopoly and competition, we should now turn to the druggist and the sale of the trade-marked article. But before defining a trade-marked article, we will consider briefly, standards of legality. With reference to the nature of common-law standards, such as due care, reasonableness and constitutional standards, such as due process, Dean Pound has defined them as "legally defined measures of conduct to be applied by or under the direction of tribunals. It will be noted that a common idea of reasonableness or fairness runs through them all, and in consequence, they must have a variable application with time, place and circumstances. Moreover, most of them contain a large moral element and so application of them calls for common sense or the average moral judgment rather than deductive knowledge."

With respect to legislative standards, the progression from the policy of enforced competition under the Sherman Act to the principle of administrative supervision of business practices by the Federal Trade Commission has been previously shown. Justice Brandeis in delivering the opinion of the Court in the case of the Board of Trade of City of Chicago *vs.* United States (246 U. S. 231,238) said:

> "The legality of an agreement or regulation cannot be determined by so simple a test as to whether it restrains competition. Every agreement concerning trade, every regulation of trade, restrains. To bind, to restrain, is of their very essence. The true test of legality is whether the restraint imposed is such as merely regulates and perhaps thereby promotes competition or whether it is such as may suppress or even destroy competition. To determine that question the court must ordinarily consider the facts peculiar to the business to which the restraint is applied; its condition before and after the restraint was imposed; the nature of the restraint and its effect, actual or probable. The history of the restraint, the evil believed to exist, the reason for adopting the peculiar remedy, the purpose or end sought to be attained, all are relevant facts. This is not because a good intention will save an otherwise objectionable regulation or the reverse; but because knowledge of intent may help the court to interpret facts and to predict consequences."

Now as to the definition. A trade-mark may be defined "as a name, sign, symbol or device which is attached to goods offered for sale in the market so as to distinguish them from similar goods, and to identify them with a particular trader, or with his successors, as owners of a particular business, as being made, worked on, imported, selected, certified or sold by him. It has been aptly described as the commercial substitute for one's own autographic signature, certifying to the genuineness of the goods to which it is affixed." (63 Corpus Juris, page 308.) The extent to which this property right in the trade-mark has existed is evidenced by the following quoted from the case of Arbutnot, Latham & Co. *vs.* Cage Drew Co., (6 La. A. (Orleans) 374,375):

> "It is elementary that the right of property in trade-mark is not derived from any statute whatever, but is a so-called 'common law' right which has existed and been recognized and protected by the courts of all commercial nations from time almost immemorial."

That the object of the trade-mark is two-fold may be stated by citing quota-

tions from two cases. From Shaw Stocking Co. *vs.* Mack (12 F. 707,710) "First to protect the party using it from competition with inferior articles; and second to protect the public from imposition;" and from Peter Schoenhofen Brewing Co. *vs.* Maltine Co. (30 App. D. C. 340,343) "It serves a two-fold purpose—to protect the owner from unfair competition, and the public from being deceived."

The relief afforded when trade-marks have been infringed is often expressly placed upon the ground of an exclusive property right in the use of the trade-mark itself, as when in Kann *vs.* Diamond Steel Co.(89 F. 706), the court held that "every suit to restrain the infringement of a trade-mark is founded on the fact that the action or the proposed action, of defendant has deceived, or is calculated to deceive, ordinary purchasers buying with usual care, so that they have purchased, or will probably purchase, the goods of defendant under the mistaken belief that they are those of the complainant, to the serious damage of the latter." In some instances the relief afforded is often expressly placed on the ground that the public is also deemed entitled to protection, as when in the case of Avenarius *vs.* Kornely (121 N. W. 336,342) the court said:

> "Actions to restrain the infringements of trade-marks are based upon the doctrine that the law will not allow one person to sell his goods as and for the goods of another, and this is to prevent not alone fraud upon private rights, but as well upon the public."

But the real basis of the remedy for infringement is the protection of one's property rights in his business and good-will. Thus where a product has been advertised and marketed under a trade name to such an extent that the public mind has been brought to the point of associating it with its manufacturer or producer, such manufacturer or producer has established a good-will in the featured word or trade-mark which the court will protect. In considering property rights in trade-marked items, stress is laid upon good-will as the substantial thing which the law protects against invasion, and this good-will provides the theoretical basis upon which to afford redress against the piracy of marks and names. We quote the following from Schechter, Historical Foundations of Trade-Marked Law, page 171: "It is not essential in protecting trade-marks that they be classified as property, since equity should prevent the destruction or impairment of the probable expectancy of trade or custom, of which the trade-mark is a symbol as well as a creative factor." The law of unfair competition is the natural evolution of the law of the trade-mark, out of which it has grown. The earlier cases were decided on the ground of trade-mark. The present tendency is to decide every case on the ground of unfair competition, by making the decision turn on whether or not the effect of what was done is to pass off the business or goods of one man as the goods or business of another regardless of the existence of any technical trade-mark. Protection against unfair competition is afforded on the same general principles on which technical trade-marks are protected, the cases are all unfair competition in trade.

Although generally speaking, the owner of the trade-mark has the right to its exclusive use, that a monopoly of goods is not conferred by a trade-mark is set forth in the principles of law stated in 63 Corpus Juris page 322, where it is stated:

> "The owner of a trade-mark has no right of property to prevent others from manufacturing, producing or selling the same article to which it is attached. The trade-mark confers no exclu-

sive right in the goods to which the mark has been applied. Such a right can be acquired only under the patent or copyright laws. Anyone, unless prevented by a copyright or patent, may make and sell goods, similar in all respects to the goods sold by another under a trade-mark, and he may also use the trade-marked article in his business, and advertise to that effect."

In the case of the Putnam Nail Co. *vs.* Dulaney (140 Pa. 205, 213) it was held that "A man may make any article he pleases that is not protected by a patent. He may imitate it so perfectly that the one may be mistaken for the other, but he may not sell his own article and as for that of another, by means of a trade-mark in imitation of the trade-mark of such other person."

Further, in connection with the rights and privileges which emanate from monopoly, competition and control of substitution, we quote the following from 41 Harvard Law Review, 728, 745, by Carpenter, Interference with Contract Relations:

"Whether a privilege of invasion exists depends upon whether it is of greater moment to society to protect the defendant in the invading activities than it is to protect and guard the plaintiff's interest from such invasions. An evaluation and balancing of the social import of the conflicting interests of the respective parties and of the social interests per se are involved. The defendant may be privileged to invade an interest of the plaintiff although it is not for the protection or furtherance of any interest of his own, if the invasion is in furtherance of a social interest of greater public import than is the social interest involved in the protection of the plaintiff's individual interest. Where the protection of the actor's interest is involved, there is simply a privilege to invade equal or inferior interests, but not superior ones."

With reference to the structural imitation or copying in trade-marks, trade names and unfair competition, we quote the following principle of law:

"In the absence of any representation that the product offered is that of another, an unpatented article or uncopyrighted book may be reproduced by any one in the precise original form and shape. The subsequent trader may be required clearly to distinguish his goods so that they may not be mistaken for the goods of the prior trader, although he will not be required, merely in order to change the appearance of the product, to sacrifice strength, durability, efficiency and cheapness. However, where goods are cast into a distinctive form, which has acquired a secondary meaning, unnecessary and deceptive imitation of the size, shape and structure of the article itself will be enjoined as unfair competition. Functional features may be used and copied in the absence of any other features calculated to deceive. The copying or imitation of non-functional features may be evidence of fraudulent intent constituting unfair competition, but necessary elements of mechanical construction, essential to the practical operation of a device, and which cannot be changed without either lessening efficiency or materially increasing expense, afford no presumption of an attempt to compete unfairly. Copying or imitation of the distinctive marks, ornamentation, lettering, etc., making up the dress of goods of another is unfair competition, although the article itself may be copied." (63 Corpus Juris page 459.)

With reference to advertisements, circulars and notices, we quote the following principle of law.

"Unfair competition may be affected by means of circulars or advertisements, and circulars, advertisements or other announcements calculated to deceive the public and pass off defendant's goods or business as the goods or business of plaintiff will be enjoined. However, where the advertising matter is necessarily similar and defendant does nothing to deceive the public, it has been held that he is not guilty of unfair competition. The imitation or copying of complainant's circulars and advertisements is strong evidence of fraud and unfair competition and is ground for an injunction." (63 C. J. page 461.)

Many and various cases may be cited that have been decided in connection with trade-marked preparations from the standpoint of property rights, dishonest business practices, unfair competition, effect on ultimate purchaser, etc.

In the Gray *vs.* Armand Co. (Court of Appeals of District of Columbia 1928) (58 App. D. C. 50), where the silhouette head of a lady of the time of Louis XVI was used for advertising purposes but not on the package sold, it was held that to establish a right to the registration of a trade-mark, two things are necessary: That the trade-mark must have been actually applied to vendible goods, and that the goods have been sold in interstate commerce. Further, that property in a trade-mark can only be acquired by the actual application of it to goods of a certain class, so that it serves to indicate the origin of the goods—that is to say, to identify them with the particular manufacturer or trader, and to distinguish them from similar goods.

In the case of Upjohn Co. *vs.* Wm. S. Merrell Chem. Co. (Circuit Court of Appeals of the United States, Sixth Circuit 1920) (26 F. 209) the plaintiff in the Spring of 1908 manufactured a thin, oblong, rectangular phenolphthalein wafer, colored pink, with a specially compounded flavor, each wafer indented so as to be easily broken into two equal parts, and adopted the arbitrary trade name "Phenolax" or "Phenolax Wafers," and spent some $30,000.00 in advertising it. In the Summer or early Fall of 1908 the Wm. S. Merrell Chemical Company put up a phenolphthalein wafer which was indistinguishable from that of the plaintiff, but did not use the word "Phenolax" and packed the phenolphthalein wafers in bottles or packages of standard form. The court decided this case of unfair competition against the Upjohn Company, in that it was decreed that they could have relief only against an attempt to palm off on the purchasing public the goods of the defendant as goods of the plaintiff (which the Wm. S. Merrell Company had not done); further, that the Wm. S. Merrell Company or any one else had the right to enter into competition in the manufacture of laxative phenolphthalein wafers, as the public by October 1908 had not come to look upon all phenolphthalein wafers as "Phenolax Wafers" as made by the Upjohn Company. It was also brought out in this case, which was not instituted until 1920 (twelve years after the wafers were first manufactured) that the defendants had continued the manufacture of phenolphthalein wafers without interruption since 1908 and that of late years other manufacturers were also making phenolphthalein tablets. It was also brought out in this case that there is injustice in the state of a law which denies protection to a plaintiff who has expended $30,000.00 in introducing his particular product, but it must be remembered that in this case the expense indivisibly inured to the advantage of the trade-mark "Phenolax" which is now fully respected; and in any such case it may be the lesser evil that plaintiff must fail of full protection rather than that free choice of common form should be denied to competitors.

The case of the Bayer Company *vs.* United Drug Co. (District Court of United States S.D. New York, 1921) (272 F 505) dealt with a product which had enjoyed a monopoly for seventeen years through the fact that it had been patented. The suit was brought to enjoin infringement of the plaintiff's common-law trade-mark "Aspirin." Patent was secured by plaintiff's predecessors in February 1900 for "acetyl salicyclic acid." The predecessors also registered the trade-mark in the United States on May 5, 1899, and the Bayer Company held both common-law and

the registered mark by proper assignments. The Bayer Company manufactured the drug in bulk and sold it under its name to all the leading manufacturing chemists. These manufacturers compressed the powder into tablets, and put them out for many years in their own packages, with the word "Aspirin" and their own names on the labels, with no reference to Bayer. Many well-known manufacturing concerns appeared to be independent manufacturing sources of it. The public became familiar with the name "Aspirin" in association with a variety of dealers during a period of over ten years, and no advertising by the Bayer Company reached the consumer. In the autumn of 1915, less than two years before the patent expired, the Bayer Company refused to sell the powder to manufacturing chemists and made the tablets for itself. The tablets were widely advertised by direct appeal to the consuming public, and sold in small tin boxes of as few as 12 tablets to the box. The boxes were labeled "Bayer—Tablets of Aspirin." Large quantities of tablets or capsules, 24, 50 and 100, were sold in bottles and they all bore the legend "Bayer—Tablets of Aspirin" or "Capsules." In deciding the case the court held the mark to be a true trade-mark so far as the trade (as distinguished from the general public) was concerned, but not so far as the public was concerned. The court granted an injunction against the direct sale of the drug acetyl salicylic acid under the name of "Aspirin" to manufacturing chemists, physicians and retail druggists; but gave the defendant the right to sell acetyl salicylic acid direct to consumers under the name "Aspirin" without suffix or qualification; in sales to retail druggists the tablets to be packed in bottles or boxes of 50 or less, labeled "Aspirin," provided these bottles or boxes be wrapped or boxed in containers marked "Acetyl Salicylic Acid" manufactured by defendant without the word "Aspirin," and that in making sales to retail druggists, the invoices, bills of lading, etc., refer to the drug as "Acetyl Salicylic Acid." Each party won and each party lost, "Aspirin" was declared to be a trade name when selling direct to manufacturers, chemists, physicians and retailers, but a descriptive word for the consuming public.

In the case of Winthrop Chemical Co. Inc. *vs.* Blackman, *et al.* (285 N. Y. Supreme Court 443) it was held that the arbitrary trade-marks denoted goods of definite manufacture and were not descriptive words. The decision enjoining defendants from using trade-marked terms was affirmed. The trade-marks "Theobrominal," "Aristol" and "Kre-o-Minal" were held infringed by defendants' use of such terms. Although there was one dissenting opinion, the four other judges concurred in the opinion that the trade-mark "Veronal" was infringed by defendants putting out "Barbital" with accompanying words "Introduced as Veronal" or "Equivalent of Veronal;" and that the trade-mark "Protargol" was infringed by the defendants putting out "Silver Proteinate" with accompanying words "Introduced as Protargol." The patent rights on Veronal and Protargol had expired. In delivering the opinion, Justice McAvoy said in part:

"The names 'Veronal' and 'Protargol' are not descriptive words or generic terms solely identifying the drugs in question. They represent in effect, in their secondary meaning in the trade, products of plaintiff which it is entitled to use exclusively even after a patent has expired, since the other terms have throughout the patent period been applied to the products in question. There may be instances where an arbitrary name may so identify an article that no other term is its equivalent, but all of these remedies have chemical names apart from their proprietary designations by which they may be purchased and purveyed to the medical profession, by whose mem-

bers they are usually ordered and prescribed.—The cases in which a patent's expiry permits the use of the patented name on another's product apply only where no other term would give it meaning in the public domain."

The case of Bourjois, Inc. *vs.* Park Drug Co., Inc. (Circuit Court of Appeals of the 8th Circuit) (82 F. (2d) 468), which was a case appealed from the District Court of the U. S. for the Eastern District of Missouri, was tried on the issue of unfair competition, and the decision was that the "Court could not issue an injunction to prevent unfair competition unless fully persuaded by convincing evidence that the defendant has offended as charged." In this case the Bourjois Company sold "Evening in Paris" Face Powder at $1.10 per box. The Park Drug Co. advertised the "Evening in Paris" Face Powder, Lipstick and Perfume, as a loss-leader, at 69¢. The Bourjois Company hired a shopper to buy all of their Bourjois products offered for sale at cut prices. "Excella" was a face powder sold in St. Louis by the defendant, upon which the defendant made a large profit. Employees of the defendant were accused of misrepresenting the composition of the "Evening in Paris" powder, but this charge was not sustained in court. The following is part of the opinion given by the court in this case:

"In action to enjoin unfair competition by mercantile corporation, conduct of corporation's clerk in pushing sale of face powder competing with that of plaintiff and switching prospective customers to such competing face powder *held* not unfair competition so as to justify an injunction, where sales were pushed by way of honest representation and persuasion."

The case of Illinois Watch Case Co. *vs.* Hingeco Mfg. Co. (Circuit Court of Appeals 1st District from District Court of United States for District of Rhode Island) (81 F. 2d 41) concerned designs for two compacts, both more or less flattened, but one of a "Tulip" design and the other of "Acorn" design, the powder pad of the first marked "Elgin," powder of second not marked, but individual boxes in which they were enclosed was marked "Cara Mia." The two designs did not have substantially the same effect on the eye of the ordinary observer, and it was held that the Acorn design compact did not infringe the Tulip design. In considering the issue of unfair competition in this case, it was stated that "the essence of unfair competition is fraud, which is a question of fact, and it is sufficient to make out a case to show that the natural and probable result of defendant's conduct is to deceive ordinary purchasers buying under ordinary conditions into believing that they are purchasing the goods of one manufacturer for those of another."

The growing tendency of the courts to interfere to prevent fraud is evidenced in the case of Allen Mfg. Co. *vs.* Smith (229 N. Y. S. 692), which concerned two fly sprays for cattle, one known as "So-Bos-So" and the other "E-Z-Bos." Action was brought to enjoin defendant against infringement of trade-mark, unfair competition, disparagement of plaintiff's product and against dishonest business practice. From a judgment granting plaintiff an injunction and damages, defendant appeals. Judge Sears, in holding that the court was correct in enjoining its practice of false disparagement of plaintiff's product, said:

"The judgment which is here under review restrains the continuance, both of the practice of false and fraudulent disparagement and of the practice of dishonest business methods. The

jurisdiction of the courts to restrain libels, including false disparagement of competitor's goods, has been vigorously denied and asserted. In England the equity courts formerly refused such jurisdiction. Now, however, the jurisdiction is fully recognized. In New York State the tendency has been against allowing such jurisdiction. Actions for unfair competition are not now confined to passing off cases."

In reaching his conclusions Judge Sears reviewed the opinion given in Burrow *vs.* Marceau (109 N. Y. S. 105) in which the following language is used:

"As I understand it, there is no hard and fast rule by which it can be determined when the court will interfere by injunction to prevent what is practically a fraud upon a person engaged in business by the unfair methods of competition. Each case must depend upon its own facts, but where it is clearly established that an attempt is being made by one person to get the business of another by any means that involves fraud or deceit, a court of equity will protect the honest trader and restrain a dishonest one from carrying out his scheme."

Continuing his decision, Judge Sears said:

"The courts have been increasingly inclined to protect business interests, even when such interests do not come within strict definitions of property. The judgment here in enjoining false and fraudulent disparagement, protects the intangible, but real, relationship existing between the merchant and his usual customers—his 'good-will.' The unfortunate result of denying equitable relief in such an instance as we have before us, illustrates the justice of Dean Pound's words (29 Harvard Law Rep. 640, 668) 'In substance the traditional doctrine puts any one's business at the mercy of an insolvent malicious defamer, who has sufficient imagination to lay out a skilful campaign of extortion.'"

In the case of A. Hollander & Son, Inc. *vs.* Philip A. Singer & Bro., Inc. (110 N. J. Equity 52) the court considered the effect of the trade-mark upon the ultimate purchaser. In this case the test in determining whether a trade-mark is infringed was whether alleged infringing trade-mark so far resembled another mark as to be likely to be mistaken for it by casual or unwary purchaser. The trade-mark was "Hudson Seal" on furs. Both manufacturers had stamped skins with "Hudson" with only a slight difference in connection with the direction of the lines composing the design around the word. In adjudicating the case, the judge quoted from the Rogers Silver Cases "That the defendant had sufficiently distinguished its goods from those of the complainant as far as jobbers and possibly as far as retail dealers are concerned. If there were no other class of persons that might be misled, I would say that notwithstanding the imitation of the name, the complainant was not entitled to an injunction. But the case is different when it comes to the ultimate purchaser. The law is well settled that if the manufacturer puts it in the power of the retailer to misrepresent, he is answerable for the probable consequences," and in the second of the Rogers Silver Cases, the Justice said: "It is elementary that the person to be considered is not the jobber or wholesaler, but the ordinary purchaser at retail."

Substituting, or dispensing a different article for, or in lieu of any article prescribed, ordered or demanded, or otherwise deviating from the terms of the prescription, order or demand, is a live question with the manufacturers, retailers and the public of to-day. Fundamentally, all of these groups are unalterably opposed to these practices. Eight or nine of the states have passed Anti-Substitution Laws in one form or another. Other states have proposed Anti-Substitution Laws

for enactment, but have not agreed as to whom should be given the responsibility of enforcing such laws. Recently, in the Court of Special Sessions, County of Kings, New York, two brothers, operating a pharmacy at Coney Island, New York, were convicted on charges of having used a substitute in compounding a physician's prescription. Our popular magazines carry the statement "REFUSE SUBSTITUTES; BUY THE ADVERTISED BRAND EVERY TIME!" Manufacturers are adding reagents and indicators to their trade-marked preparations to assist in detecting substitution more readily. They are also requesting that prescriptions and orders be written so as to distinctly specify the trade-marked article; and are stressing their rights in the trade-marked preparation to the retail dealer. In fact, it is stated that the number of reports of the practice of substitution is declining. Prescription Protective Bureaus are being established to warn against, and to check and discipline substitutors.

When one considers whether the monopolistic property rights in trade-marks are to be defended or restrained; whether competition is to be encouraged and upheld, or regimented; whether stringent laws with reference to substitution are to be promulgated and actively enforced; it may be well to note one paragraph in the decision given by Chief Justice White, who delivered the opinion of the Supreme Court of the United States in the celebrated case of the Standard Oil Co. of New Jersey *vs.* United States (Supreme Court of the U. S. in 1911) (221 U. S. 1) when dissolving the Standard Oil Company under the provisions of the Sherman Anti-Trust Law:

> "In applying remedies for this purpose, however, the fact must not be overlooked that injury to the public by the prevention of an undue restraint on, or the monopolization of, trade or commerce, is the foundation upon which the prohibitions of the statute rest, and moreover, that one of the fundamental purposes of the statute is to protect, not to destroy, rights of property."

Who has the superior interest in the trade-marked medicine—the manufacturer, the retailer or the customer? Regardless of the decisions that have been made and may be made by courts, and the laws that have been enacted and may be enacted and enforced, if pharmacists are to hold the high professional place that rightly belongs to them, there can never be a compromise between right and wrong. The manufacturer has certain property rights in trade-marked articles, but he should have pride in that his article is chosen on merit rather than on account of the more or less elusive monopoly that may be established through the exclusive control of the manufacture of certain articles. The retailer should respect the rights of the manufacturer, remembering that he (the retailer) has at the same time fundamental rights of his own with respect to wholesome and lawful competition. Under any circumstances the retailer should eschew substitution. Although another preparation is the chemical equivalent of the trade-marked preparation, this does not give the right to substitute one for the other when a certain one is specified. The retailer should be ever mindful that, under the existing economic conditions, he is the person responsible to see that the public receives the medicine it orders or demands. He should not deviate from the kind, quantity or quality of the ingredients specified on prescriptions; but he has, at the same time, a fundamental right to sell in open competition another article other than that ordered or demanded, but of a similar nature, with the knowledge and consent of the customer.

THE AMERICAN PHARMACEUTICAL ASSOCIATION AS A FACTOR IN AMERICAN FOOD AND DRUG LEGISLATION.

BY J. H. BEAL.*

In 1848 the Federal Congress enacted what was commonly referred to as the "Drug Law," designed to control the quality of drugs imported from foreign countries. Drug Inspectors were appointed for the several ports of entry, but it is recorded that the government failed to provide books, apparatus, reagents or other equipment through which the inspectors might determine the authenticity or quality of the drugs they were required to pass upon.

Differences of opinion soon arose between the importers of foreign drugs and the drug inspector at the Port of New York, both as to the interpretation of the law and as to the propriety of the standards adopted, and these were quite naturally brought to the attention of the faculty of the College of Pharmacy of the City of New York.

In order to obtain a consensus of authoritative opinion upon the various questions presented to it and to promote uniformity in interpretation of the law at different ports, the New York College addressed a communication to the Colleges of Pharmacy in Philadelphia, Boston, Baltimore and Cincinnati, inviting them to send representatives to a meeting to be held in New York on Oct. 15, 1851. On the date named nine delegates assembled at the rooms of the College at 511 Broadway, New York, three each from the New York, Massachusetts and Philadelphia Colleges.

Dr. C. B. Guthrie of the New York College of Pharmacy, was elected temporary president, and on taking the chair announced the object of the meeting to be:

> "The adoption of a series of standards for the use of the Drug Inspectors at our different ports, whereby their action might be rendered more uniform and satisfactory; as well as the proposal of any measures that might be calculated to elevate the profession, and promote their interests throughout the country."

Communications from the New York College of Pharmacy, from the Maryland College of Pharmacy, from Wm. Procter, Jr., of Philadelphia and from the drug inspector of Boston were presented, and after discussion were referred to a committee of three instructed to report at the next session.

At the second session of the Convention the committee reported a series of resolutions which, after amendment, were adopted in the following form:

> "1st. All drugs and chemicals employed in manufacturing chemical preparations used in medicine, may be admitted of less than standard purity, upon sufficient bonds being given that such articles are solely to be devoted to said uses.
>
> "2d. Opium should not contain less than eight per cent of pure morphia, unless intended for manufacturing, as above stated.
>
> "3d. Two varieties of Scammony should be admitted—"Aleppo Cake Scammony," that contains not less than forty per cent of "true Scammony Resin;" and the so-called "Virgin Scammony," that contains not less than sixty-five per cent of the same resinous principle.
>
> "4th. All Elaterium not containing twenty-five per cent of Elatin should be rejected.
>
> "5th. Iodine, unless intended expressly for manufacturing, should not contain more than three per cent of water, and should be free from all other impurities.

* Fort Walton, Florida.

"6th. Gum resins used solely in medicine, as Assafœtida, Ammoniac, etc., should be rejected when they contain more than fifteen per cent of extraneous matter, whether accidental or designed.

"7th. Barks derived from the Cinchonas growing in the northern provinces of South America, and which contain Cinchonia with or without "Quinia." should be admitted; all other barks, sold as Cinchona barks, should be rejected.

"8th. As there is no good reason for the introduction of European Rhubarb into this country, owing to its inferior strength, we recommend that all Rhubarb of European origin be excluded.

"9th. The uninjured portion of partially damaged drugs, etc., may be admitted, provided the importer will, under the superintendence of the Inspector, cause all the damaged parts to be removed; and drugs otherwise good, if loosely admixed with extraneous substances to such an extent that in the proper construction of the law, they would be rejected, may be passed if the importer will remove all such extraneous parts under the direction of the Examiner.

"10th. It is recommended that the Examiner collect and deposit in his office a cabinet of specimens of drugs, chemicals and permanent medicinal preparations, as complete as practicable, to be used for comparison in the course of inspection.

"11th. and finally. This Convention respectfully and earnestly recommends, as the useful working of the law, after all, depends mainly on the integrity and ability of the Examiners, that the greatest carefulness should be exercised by the appointing power in the selection of these officers, in furtherance of which the Colleges of Pharmacy would cheerfully render their assistance if solicited."

Dr. Samuel R. Philbrick, of Boston, presented the following resolution, which was also adopted:

> "WHEREAS, To secure the full benefits of the prohibition of sophisticated drugs and chemicals from abroad, it is necessary to prevent home adulteration,—
>
> "*Resolved*, that this Convention recommend to the several Colleges to adopt such measures as in their respective States may be best calculated to secure that object."

In consequence of a call issued by instruction of this first Convention, a second Convention assembled at the Hall of the Philadelphia College of Pharmacy on Oct. 6, 1852, at which time credentials were presented by delegates from the Massachusetts College of Pharmacy, the College of Pharmacy of the City of New York, the Cincinnati College of Pharmacy, the Philadelphia College of Pharmacy, the Maryland College of Pharmacy and the Richmond Pharmaceutical Society. At this meeting, which may be regarded as an adjourned session of the meeting in New York, the AMERICAN PHARMACEUTICAL ASSOCIATION was formally organized, and from this period this society dates its existence.

The principal business of the Philadelphia Convention consisted in the consideration of a report from Dr. M. J. Bailey, Drug Examiner of the Port of New York, which showed that within the space of four years entry had been refused to more than 610,000 pounds of spurious and adulterated drugs. A similar report from Edward Hamilton, Drug Examiner for Boston and Charleston, related the rejection of nearly 13,000 pounds of spurious and adulterated drugs at the latter port.

Thus it will be seen that at its very inception the declared primary objective of the A. PH. A. was the creation and enforcement of appropriate legal standards for drugs and medicines.

At the sixth annual meeting, held at Philadelphia in 1857, there was presented the first of the many admirable Reports on the Progress of Pharmacy, by Wm. Procter, Jr., in which was summarized the qualities of drugs and medicines in America and foreign commerce, occupying 29 pages of the printed proceedings.

Other reports and papers under various titles, related in the main to the improvement in quality of drugs and medicinal compounds.

Nor did the ASSOCIATION confine itself to a merely academic discussion of drug standards. From the very beginning of its existence it actively advocated State and Federal legislation to make these standards legally effective. It regularly reported and discussed drug legislation in foreign countries, and constantly urged the members of the ASSOCIATION to labor for the enactment of similar laws in the United States.

By the time of the seventh annual meeting, held in Washington, D. C., in September 1858, the printed PROCEEDINGS had grown to be an imposing volume of nearly 500 pages, most of which was devoted to the improvement of the quality of drugs and medicines. In this volume also appears a direct appeal to Congress in the form of a petition to the House of Representatives for amendments to the Federal Drug Law of 1848, relating to the standard of drugs imported into the U. S.

Sentiment in favor of anti-adulteration legislation grew rapidly in the last quarter of the last Century and by 1900 many, perhaps a majority, of the states were provided with more or less efficient food and drug laws. In some cases the laws relating to foods and those relating to drugs were embraced in separate statutes, the enforcement of the drug laws usually being entrusted to the Boards of Pharmacy of their respective States. This method of administration was natural owing to the fact that the Boards of Pharmacy were usually the most active proponents of such laws.

With the growth of general public sentiment in favor of legislation regulating the quality of food and drugs, and following the enactment of such laws in the various states, an increasing number of food and drug chemists were employed in the enforcement of the state laws, and such chemists very generally became members of the A. PH. A.

These various state laws had a highly beneficial effect upon the qualities of foods and drugs offered for sale, but owing to our dual form of government many difficulties arose in their effective execution. For example, a druggist charged with selling a sub-standard drug would claim that it was obtained from a wholesaler or manufacturer in another state, and that he had purchased it innocently believing it to be pure. Thus the state authorities were confronted with the necessity either of prosecuting dealers who might be innocent of evil intent, or of permitting drugs shipped across state lines to escape proper supervision.

An early proposal for the curing of these and other apparent defects in the state laws was that the United States Congress should enact blanket legislation which should operate as a police measure in all of the states and be enforced by Federal authorities, the late Prof. Oscar Oldberg, Dean of the Illinois College of Pharmacy, being one of the most urgent proponents of this plan.

When it was made clear that under our form of government only state laws can be operative within state limits, it was next proposed that a Federal Law based upon the unquestioned power of Congress to regulate inter-state commerce should provide the standards which must be met by foods and drugs when shipped across state and territorial boundaries or when imported from foreign countries.

Dr. Harvey W. Wiley, a prominent member of the A. PH. A., if not the first to suggest this plan was certainly most assiduous in putting it in execution, and in co-

operation with Prof. J. P. Remington and others of like mind promoted what eventually came to be known as The National Food and Drugs Congress, a loosely organized group without fixed rules of procedure or membership dues. It was in fact a popular convention, meeting each year in Washington shortly after the annual convening of the United States Congress, and frankly designed to advocate Federal legislation regulating the qualities of foods and drugs when transported in interstate commerce. It was due largely to the activities of the group of enthusiasts assembled in this special organization that the Federal Food and Drugs Act of June 30, 1906 was enacted.

Among the A. PH. A. members whom I remember meeting most frequently and as most active in this new organization and in the work of its committees were Prof. Joseph P. Remington, Mahlon N. Kline and Dr. Geo. D. Rosengarten, of Philadelphia; Dr. Robert G. Eccles, of Brooklyn; Charles E. Dohme and Prof. Charles Caspari, Jr., of Baltimore; Enno Sander and Dr. J. M. Good, of St. Louis; George J. Seabury and George M. Beringer, of New Jersey; Albert E. Ebert, Wilhelm Bodemann, George P. Engelhard and Thos. V. Jamieson, of Chicago; Dr. John N. Hurty, of Indianapolis; S. A. D. Sheppard, of Boston; William O. Allison and Thos. P. Cook, of New York; and Leo Eliel, of South Bend, Indiana; though numerous other A. PH. A. members attended the meetings for the purpose of interviewing their respective United States Senators and Members of the House of Representatives.

The A. PH. A. members of the Food and Drug Congress were exclusively responsible for the inclusion in the Food and Drugs Act of the U. S. P. and N. F. as the standards for medicinal drugs, and also for the introduction of the so-called variation clause which is necessary in order to permit the inter-state shipment of drugs of commercial quality for industrial and commercial uses. Only state laws can regulate the quality of drugs sold within state limits; only Federal laws can regulate the quality of drugs shipped across state boundaries. Both are necessary to a system of complete drug control.

In the collection, analysis and correlation of data, including the development of efficient methods of assay, the AMERICAN PHARMACEUTICAL ASSOCIATION has accumulated in the more than 60,000 pages of its printed PROCEEDINGS, YEAR BOOK, Bulletin and JOURNAL a greater volume of the kind of information upon which drug standards are based than can be found in any other body of literature covering the same period of years.

The A. PH. A. has been equally active in other phases of drug legislation. It was the first organized group in the United States to advocate the legal regulation of the sale of poisons. Through its committees it prepared models of such laws and urged their enactment. Every poison label law now on the statute books of the various states is based upon these A. PH. A. models. The same is also true of the various state laws regulating the practice of pharmacy, all of which are based on A. PH. A. models.

Similarly the A. PH. A. was a pioneer in the promotion of legislation designed to restrict and regulate the distribution of habit-forming narcotic drugs, and every such law now in existence, including the Federal or so-called Harrison Act, is based upon A. PH. A. model forms, and their enactment into laws has also been due largely to the activities of the ASSOCIATION and of its members and committees.

The declared purpose of the first or preliminary meeting of the ASSOCIATION in the rooms of the New York College of Pharmacy Oct. 15, 1851 was to advocate the improvement and to aid in the enforcement of the then existing drug law, and the promotion of similar or related legislation has been among its leading activities throughout the 86 years since that date. Within this field no other American society or institution has rendered services of equal extent or value.

The National Formulary Exhibit, reproduction of the Display of the American Medical Association at Atlantic City.

NATIONAL FORMULARY PREPARATIONS DISPLAYED AT AMERICAN MEDICAL ASSOCIATION CONVENTION, ATLANTIC CITY.

BY MARVIN J. ANDREWS.

Among the Scientific Exhibits of the American Medical Association at the Atlantic City convention hall during the week of June 7, 1937, was a booth under the auspices of the AMERICAN PHARMACEUTICAL ASSOCIATION. This exhibit consisted of N. F. Preparations of interest to prescribing physicians. Examples of preparations of therapeutic importance representing convenient and satisfactory dosage forms and vehicles designed to aid the physician in prescribing attractive and palatable prescriptions were on display.

The exhibit was designed to attract attention to the newer N. F. preparations and to give actual illustrations of how these preparations may be prescribed. The display attracted the attention of hundreds of physicians, many devoting long periods of their time to a careful scrutiny of the display material and a discussion of their personal problems. Over 500 members of the Association from all parts of the United States and Canada registered at the National Formulary Booth. Approximately 2000 pamphlets entitled, "Notes for the Physician from the National Formulary Sixth Edition," were distributed.

The Convention was the most successful in the history of the Association, approximately 10,000 physicians registered at the meeting.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

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ONE of the most hopeful signs of the times is the fact that those engaged in pharmaceutical education have come to the realization of the fact that if they are to attain the highest efficiency in their special field they must concern themselves in secondary education, education on the college level and education in related professional fields. Isolation of pharmaceutical education is fast becoming a condition of the past. The same condition has prevailed as regards pharmaceutical research. Through four decades Dr. Edward Kremers has been the leading exponent of the philosophy that pharmacy must become productive in its own right in the field of research and cease to be parasitical upon the other sciences. The answer to that philosophy is a vast army of highly trained young men now engaged in productive research in the pharmaceutical sciences. When Dr. Henry B. Ward a few years ago became the permanent secretary of the American Association for the Advancement of Science, he energetically set himself to the task of bringing about a closer relationship between the sciences, pure and applied. As a result there was established a pharmacy and a dentistry sub-section to the Medical Science Section. Thus pharmacy allied itself with all the other sciences in the mass effort to advance human progress through scientific research. On June first, Dr. Ward retired from active service as Secretary of the American Association for the Advancement of Science and at the request of the Editor of the *American Journal of Pharmaceutical Education* he wrote the article on "Pharmacy and the American Association for the Advancement of Science" printed in this issue. It points the way to greater opportunity for service.

The paper entitled "The Iowa Interprofessional Association" by Walter F. Meads, Secretary of the Association and of the Iowa Pharmacy Examiners, contains material which has more than a local interest. In it Mr. Meads discusses clearly and convincingly the wide and fruitful field of service that such an association can accomplish. He points out the part colleges of pharmacy can take and must take in the accomplishment of the purposes of such an association. For this reason the Editor requested permission to publish the paper in the *American Journal of Pharmaceutical Education* and the Editor also feels that it should reach every member of the AMERICAN PHARMACEUTICAL ASSOCIATION. This accounts for its appearance in this Department. The Editor has been on a search for the smartest piece of wisdom expressed so far by any pharmacists in the year 1937. In his opinion the honor so far belongs to Mr. Meads when he says—"The pharmacist should get this one point firmly fixed in his mind, that it will never be possible to promote successfully any legislation in the interests of the profession of pharmacy, that is not backed by the sound policy of public health and welfare."—RUFUS A. LYMAN, *Editor*.

PHARMACY AND THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

BY HENRY BALDWIN WARD.*

Relations of the American Association for the Advancement of Science to the organizations and workers in the field of pharmacy is a large subject, indeed, quite too extensive to be covered within the limits of a brief article. Even the opportunities I have enjoyed for many years of intimate contact with the Association have not covered by any means the subject of possible relations between the Association

* Retiring permanent secretary, American Association for the Advancement of Science.

and any field of science. New possibilities continually arise and new relations open up which afford unexpected opportunities for the discharge of our fundamental function which is, as the name indicates, the advancement of science.

On the other hand, the considerations involved in the relations of the Association to pharmacy are not particular or limited in character. What has been or might be written of one field could, with a few changes in wording, apply with equal force to other fields of science. Pharmacy, properly considered, is truly a field of applied science, the extent and variety of which is often not fully considered. It is also a subject the beginnings of which go back to the earliest records of the human race and in all probability beyond those limits. Behind the witch doctor of savage tribes lies a mass of information accumulated through an unknown series of years which constitutes a substantial foundation, the real basis of whatever successful results he had in dealing with the true ailments of his group. His information was strikingly crude but has been verified in a marked degree by the experiments of his predecessors regarding the effects on the human system of the materials which he handles and his merit was measured by the success with which in his practice he has recognized the real and separated it from the false. The herbalist of the middle ages had risen above the witch doctor of savage times through sincere devotion to the search after new remedies and to the advance in general knowledge which through reason and experimentation had shorn the ancient profession, in large part at least, of its desire to control by terror and incantations.

To-day the pharmacist is confronted with a vast supply of new products, substances not only with changed names and revised formulas, but measured and standardized in a fashion that gives far better control than was ever known before. But beyond this, every day brings forth unheard of compounds, substances that never existed before and that have been built up to produce precise effects previously incapable of realization. The knowledge of the past is inadequate to handle the problems of the present. The worker in the field of pharmacy can no longer be satisfied or even safe with the limited training of the past. He must gain ground not merely in chemistry and among chemists but also in possibilities of understanding science in new and broader aspects if he is to discharge his duties properly and utilize the new opportunities for personal advantage and public service. He must be inspired, his views broadened by a richer, deeper understanding of the possibilities that modern science affords than he has ever had before.

This wealth of new materials at his disposal is accompanied by conditions that lay upon him greater responsibilities. The exploitation of these substances is often unmistakably commercial. Even under the best of circumstances their very newness leaves us uncertain with regard to their ultimate effects, and their utilization by untrained hands has been accompanied in well-known instances by most serious results. The common practice of many in asking for some drug of which they only know that it is widely and artfully advertised, in order to remedy conditions of which they have at most a superficial and imperfect knowledge lays upon the pharmacist a double responsibility and demands broad training and ability to discriminate between the safe and the unsafe with full appreciation of the consequences of error. For such purposes the student of pharmacy finds the appeals of the salesman and the arts of the optimist are poor training. Indeed, one may safely say that present-day conditions in pharmacy furnish greater dangers for

society than in the recent past and some added protection must be found to guard the public against the misuse of the products of modern scientific research.

One of the important lines of development in science is certainly greater emphasis upon those agencies which bring together workers in different scientific fields and are organized to interpret the results obtained in various lines, both to workers in allied sciences and also to the general public. Men frequently lament that society in general is so little informed and so scantily appreciative of the advances of science and the possibilities given for higher average well being.

The American Association for the Advancement of Science is not only the largest, but the only nation-wide general organization devoted to assembling workers from all fields of science for the discussion of problems in individual lines. Through its meetings it seeks to interpret broadly the results of study and research in one field to workers in other lines and to the public which all seek to serve. Its own programs are in the main devoted to presenting significant results of recent research. In discussions and symposia the relations of such results to other fields of science are presented and interpreted. In this way fields of pure and of applied science gain knowledge and direction for their further work.

By virtue of content and development pharmacy is intimately connected with various aspects of many other sciences. Its workers will profit by opportunities to learn at first hand of new lines of research and new results obtained in other fields. Moreover presentations of its problems will stimulate other workers to recognize undeveloped lines in their own fields and to seek to interpret new relations. Thus the American Association for the Advancement of Science serves to develop in the Section on Medical Sciences and in the subsections on Dentistry and Pharmacy phases of these subjects not ordinarily considered in clinical and technical societies in the confident expectation that thereby the future activities in these fields may be broadened and deepened.

But the sessions themselves do not represent by any means all of the opportunities afforded by the Association for the discharge of its important functions. The magnitude of its power is not measured by the roll call at individual meetings. Indeed, the attendance on particular occasions is conspicuously regional. Yet by adjustment of the series of meetings well in advance and by their distribution widely over the country, an ever-increasing circle of members is brought into contact with the organization and a larger membership served than would be possible otherwise. At the same time contact is maintained with all members through the distribution, as a membership privilege, of its various publications. In this the weekly publication, *Science*, is undoubtedly the most important element bringing, as it does at brief intervals, to the attention of all the subscribers not only the notice of plans for each meeting, but also personal information regarding scientific happenings in affiliated societies, institutions of learning, research laboratories and independent scientific gatherings. It prints also some of the leading addresses delivered by prominent scientists at meetings of the Association and on other occasions as well as brief notices regarding individual researches. The *Scientific Monthly* which appears less frequently gives those who prefer it more extended addresses and discussions of scientific achievement and summaries of advance in particular fields.

Through your own technical societies and their publications, among which I

should mention especially the new *American Journal of Pharmaceutical Education*, serving publicly the faculties and students of colleges of pharmacy, more complete information regarding technical advances is provided in the individual field of your subject, but if adequate work is to be done in any field of science, if you are worthy of the profession in which you are engaged and are serving it adequately, you must acquire further knowledge of associated subjects and of advances in standards in all fields. The last half century has seen tremendous progress in the development of knowledge and its application in varying fashion to human welfare. If that advance is to be continued, if its followers are to contribute their quota in extending the limits of knowledge, they must in some effective way be in contact with progress in other fields. Many unfortunate results follow upon failure to achieve broader contacts not the least of which is that the small society working alone and without relation to larger undertakings exercise relatively little influence on public opinion. That the American Association, with its nearly twenty thousand active members and with more than seven hundred fifty thousand members in affiliated societies, is a power will be appreciated without further emphasis. Its voice properly expressed is heard above the din of conflict of opinion. It has exercised its influence with evident success in the past and with greater prospects for the future in the development of both pure and applied science with appropriate emphasis upon research as fundamental and with the ultimate objective of advance in human welfare. It seeks to associate with itself all those who have a living interest not merely in futhering personal aims but primarily in contributing to social progress.

THE IOWA INTERPROFESSIONAL ASSOCIATION—ITS PURPOSES AND POSSIBILITIES.

BY WALTER F. MEADS.*

The past quarter of a century has witnessed rapid changes in our profession, both in merchandising and in the qualifications of the pharmacist himself. The drug store, however, remains an essential and responsible factor in caring for the public, its health and its interests. To pharmacy as a profession has been assigned not only the public's interests but the interests of the public health professions. Medicine and pharmacy are sister sciences and as such have gone down the years together; dentistry and nursing are newer in the field, but now join us in the forwarding of our own welfare and that of the public. To further the interests of *all* groups, to raise the standards of each, and to coöperate to the fullest extent one with the other, there has been organized during the last two years the Iowa Interprofessional Association.

The organization was brought about by representation of the committees of the organized professional groups in the state, namely, medicine, dentistry, pharmacy, veterinary medicine and nursing. These representatives presented a resolution for an allied organization which was presented to each organization and adopted by each at the regular annual meeting of each organization in 1935. In 1936 following a similar procedure, a constitution was presented and adopted.

* Secretary of Iowa Pharmacy Examiners and of the Iowa Interprofessional Association.

The activities as outlined relative to the development and organization of the Iowa Interprofessional Association, represent only a small part of the actual effort that has been made to make this association a reality. During the many years preceding the first meeting of the allied professions, the occasion was rare when our Pharmacy Examiner, George Judisch, and Dr. Robert L. Parker, present secretary of the Iowa State Medical Society, met and engaged in conversation that they did not discuss the possibilities of a state interprofessional organization. They may well be called the grandfather and father of the present interprofessional group: and with the interests of all member groups at heart they both took part in putting together the constitution of the association as it stands to-day.

This constitution of the Iowa Interprofessional Association states the purpose of the organization shall be to federate the professional associations of the state in order to carry out the following objectives:

> "To provide a clearing-house for the interchange of information concerning the plans and methods of organization developed by the various member societies."

Such a clearing-house has been developed between the legislative committees of the several societies to the benefit of all concerned, and if this same coördination can be developed in local groups, there will be no question as to the success of this new association. It is hoped that in bringing together members of the allied professions friendlier relations will be promoted because it is only on a basis of friendship that many problems may be brought up for consideration and settled to our mutual satisfaction.

The second objective as set out by the Constitution is:

> "To act as a bureau of research and information, to study and report on various civic problems in the solution of which the technical knowledge of professional people is of value."

Public health matters are subjects deserving of study by pharmacists. In order that the pharmacist may measure up to his responsibilities, he should always be interested in civic and community problems relating to health and take active part in their solution. If we wish to be considered by the public as professional men, more interest will be necessary in health matters. This interest would give us the opportunity also to counteract much of the unfavorable publicity that has come our way in recent years due to the emphasis that has been placed on merchandising in our stores. Active participation in local interprofessional organizations should offer such an opportunity.

The third purpose is:

> "To educate the public with respect to the aims of the member professions and the value of high-grade professional service."

Every pharmacist owes it to himself and to pharmacy to aid in acquainting the public with the service rendered by pharmacy and its importance. Much is being done along this line by our State and National Associations, but the effort of the individual pharmacist in educating the public in his own community is still sadly lacking. National Pharmacy Week offers an excellent opportunity to appear before civic and social organizations and should be taken advantage of by the pharmacist. In educating the public, the value of professional window displays should

not be overlooked. The aims and value of the other professions can easily be made a part of this endeavor.

The fourth objective is:

> "To coöperate in securing and maintaining legal and ethical standards of character and education, requisite to the rendering of high-grade professional service."

Hardly a session of the Legislature goes by that legislation is not sponsored to license a new group to engage in the treatment of disease under many and varied conditions. We must be interested in legal requirements requisite to maintaining high standards for those persons who wish to engage in health practices. The combined efforts of the five professions should be very effective in protecting the public from licensed empiricism and be of aid to us in raising the standards under which drugs and medicines may be distributed.

The fifth purpose is:

> "To coöperate with the proper legal authorities in the enforcement of professional laws."

Progress is being made in the revision of our laws and those of the allied groups; enforcement must naturally follow if real benefits are to result. If the proper authorities do not coöperate, the combined professions should have sufficient power to secure the enforcement of any laws directly affecting the professions and the public health.

The next objective of the Interprofessional Association is:

> "To coöperate in promoting plans for the advancement of the material welfare of the member professions."

The advancement of our material welfare is a prime consideration in any effort we put forth, regardless whether the reward is direct or indirect. This purpose, as well as the others mentioned, will be almost entirely dependent upon the extent to which friendly relationships are established between members of county or district associations. Our opportunities for mutual business dealings can certainly be enhanced by cordial meetings and a proper perspective of each other's problems. If we are to benefit materially by this association with other public health groups, we must recognize first that the welfare of the doctor, dentist, veterinarian and nurse must be considered and promoted. We then in our turn will receive the coöperation necessary to promote our own professional well being.

The seventh and last purpose of the Constitution is:

> "To promote the organization of county and district federations for the carrying out of the objects outlined above."

Letters have already gone forward to members of the allied associations in each county requesting assistance in organizing local or district interprofessional groups. The success in perfecting such organizations will necessarily have to depend upon the interest and enthusiasm of those who have been contacted and the support they receive from the members of their own professions.

Following the organization of county or district interprofessional groups, it is the duty of the office of the state association to receive from the member professions suggestions of plans or recommendations for consideration, and if approved, to forward same to the officers of the local organizations for attention.

The possibilities of the Iowa Interprofessional Association are many, but time will be taken here only for the discussion of a few of them. The getting together of members of the allied professions is the first step toward the promotion of friendly relations. It is only on this basis that a clearing-house can be provided for the interchange of plans and problems and a solution can be made that will be mutually satisfactory. A free interchange of suggestions and criticisms should be encouraged and good fellowship should prevail.

It should be possible for the pharmacist, through his local interprofessional association, to become more closely identified with movements promoting public and personal health and thereby enhance his professional prestige. In the past, activities along this line have been confined largely to the medical and nursing professions.

The pharmacist should be alert to the possibility of furthering the professional part of his business. There has been some activity in this state to promote a better understanding between pharmacists and physicians in the past, but only a small amount, if anything has been done with the other professions. Dental pharmacy offers a field which has not been explored to any extent in Iowa, and with some study and the proper approach, there is no reason why the pharmacist cannot create a demand for his professional service by the dentist. Our National and State Associations stand ready to advise and to assist in furthering the use of U. S. P. and N. F. preparations by the medical and dental professions, and the pharmacist should never miss an opportunity to advise and promote the use of official preparations instead of proprietaries.

A series of articles by pharmacists and physicians, on U. S. P. and N. F. preparations is appearing in the *Journal of the American Medical Association*. It is understood that these articles are to be published in pamphlet form after the series has been completed and will be available for distribution. Every pharmacist should obtain a copy and familiarize himself with the contents. This is also true of the booklets on U. S. P. and N. F. preparations published by the National Association of Retail Druggists and the AMERICAN PHARMACEUTICAL ASSOCIATION. If the pharmacist is to derive material benefits from his activity in interprofessional relations, he must prepare himself to sell professional service, and make his store one that merits professional confidence.

The matter of preparation incident to rendering better professional service, can be overcome by the pharmacist regardless of his education. Even though a library is not available, if some time will be devoted to study and to reading the pharmaceutical journals, much can be learned. Many of these publications carry useful information and might well be used as suggestions for subjects to be presented at the group meetings of our association. A part of the time in every program should be devoted to the profession of pharmacy. Here is an opportunity for the pharmacist to go to school again. One thing is sure, there never would be any lack of subjects and those of most interest to each group should be presented.

The present educational requirements, with a few exceptions, make it necessary for the young pharmacist to be a college graduate before he may be licensed in this state. It has already been called to your attention that education is a necessary requisite to successful interprofessional relations. We need, therefore, have no fears that the young pharmacist will not be qualified. It might be well, however,

to discuss for a moment the part that colleges of pharmacy should be expected to take in this movement.

It is not enough that our colleges graduate men and women as pharmacists who possess only those fundamentals of pharmaceutical practice. With improved relationships they must possess the ability to use their education to a material advantage in interprofessional contacts. One instructor in each of our colleges might well be delegated to keep in touch with interprofessional activities and coöperate with the committees of our Association. In this way their services would not only be of value to our committee but would give them a better insight of the practical problems in the every-day life of the pharmacist. Surely the obligation of the colleges of pharmacy to their students need not end with graduation.

The insight of the instructor might be broadened further if he would coöperate in promoting professional pharmacy in its many phases. Dental pharmacy is one of these phases that should have immediate attention. It is my opinion that our Association will never be successful in creating a demand for the professional service of the pharmacist by the dentist, without assistance from our colleges. The foregoing statements are merely suggestions and are in no way intended as criticisms.

Following the need of education in furthering interprofessional relations, the making of drug stores such that they merit professional confidence is next in importance. Due to the emphasis that has been placed on merchandising in many stores, it may be difficult in some instances to bring the professional side of the business before the public and the other professions, but it can be done. No movement has taken place in recent years that has done so much to awaken professional pride in the pharmacist as the open or semi-open prescription department, and I have yet to find one pharmacist who has made this change in his store who would change back to his old prescription department. On inquiry it will be found that the favorable reaction of the medical profession and the public is responsible for this attitude. There is no reason why the average pharmacist, if he is ethical, should not enjoy an increase in his professional business if he will strive for a proper balance between the prescription department and the many side-lines which he carries.

The professionalizing of a drug store will be reflected in other ways than those mentioned. An increased appreciation and a better understanding of our legislative needs by those responsible for legislation and by the other professions, should result.

The allied professions may well combine their political and legislative efforts in a common cause. The rapidly changing economic picture in this country will bring many problems not yet forseen, and the interprofessional association offers the best means of keeping in touch with these developments. Quite naturally we should stand together in the protection of our professional interests which have been developed and advanced over a long period of years, and further the candidacy of men to public office friendly to our interests.

From reports that come in from counties having such organizations, no effort will ever be necessary from the state office to stimulate interest in the political possibilities of such groups. One letter has come to the office of the secretary stating that it was largely through the efforts of the interprofessional associations in four counties of one state senatorial district, that a candidate had been defeated in the

last primary. This effort was due to the opposition by the senator to public health legislation. If this is any indication of what we may expect from such organizations, the problem that may present itself will be how to control our political activities rather than how to promote them. The Association will not justify its purpose if politics become the dominating interest.

In legislation there is no reason why the professions in the Interprofessional Association should not work together in matters that relate to public health.

After all, if legislation that is sponsored by one of the member groups is in the public interest and welfare, its enactment could have no objections from the other groups interested. The pharmacist should get this one point firmly fixed in his mind, that it will never be possible to promote successfully, any legislation in the interests of the profession of pharmacy, that is not backed by the sound policy of public health and welfare. Opinions may differ as to what constitutes such protection but laws in other states and court decisions have pretty well established precedents that necessarily must be considered in the enactment of laws in which we are interested. One thing is certain, a great deal of good can be accomplished if we will confine our efforts to restricting the conditions under which medicines may be sold outside the drug store, rather than the restriction of the sale of these medicines to the drug stores. In this we should have the whole-hearted support of the member professions of the Iowa Interprofessional Association.

In promoting the purposes of this Association, the organization has been so developed that separate projects or plans, may be carried on by the individual group without participation of the other associations. It is hoped, however, that we may profit from the experiences of each group and through their friendship further our own interests. Let us all contribute something to the Iowa Interprofessional Association.

REPORT OF THE FAIRCHILD SCHOLARSHIP COMMITTEE.

The Fairchild Scholarship Committee of this year is composed of George D. Beal, W. G. Crockett, George A. Moulton and E. G. Eberle, *Chairman*. The University of Florida, School of Pharmacy, presented no candidate for the examination and the Head of the Department of Pharmacy, Prof. B. V. Christensen, with the assistance of other members of the faculty, consented to prepare the questions for the examination and grade the answers.

Twenty-six candidates participated in the examination, representing twenty-one schools. Seven of these candidates averaged 75 per cent or more.

The examinations were given under three subjects: Pharmacy, Chemistry and Materia Medica. The highest general average was made in Pharmacy, 79.77; next in Materia Medica, 63.85; lowest in Chemistry, 63.32; general average, all subjects, 69.98. The highest per cent made in Pharmacy was, 91; in Chemistry, 84.5; in Materia Medica, 89. The lowest per cent in Pharmacy, 40; in Chemistry, 29; in Materia Medica, 16. The general average in Pharmacy was 79.77; fifteen made above that average; nineteen made 70 or over. The general average in Materia Medica was 68.98; twelve made above that average; twelve made 70 or over. The general average in Chemistry was 63.32; fifteen made above that average; ten made 70 or over. The average of the general averages was 74.052; twelve made above that; twelve made 70 or over. Scheduled report of twelve candidates follows:

Candidate.	Pharmacy.	Chemistry.	Materia Medica.	Average.
1	91	84.5	89.0	88.166
2	83	81.5	83.5	82.666
3	77	83.5	79.0	79.833
4	85	75.5	72.5	77.666
5	89	66.5	75.0	76.833
6	76	76.0	77.0	76.333
7	85	69.5	72.5	75.666
8	71	76.0	75.5	74.166
9	73	72.5	73.0	72.833
10	76	72.0	65.0	71.000
11	72	66.0	73.5	70.500
12	61	69.0	81.0	70.333

The candidate making the highest average, 88.166, made the highest record in all branches; the next in line graded 82.666.

The winning candidate's records were high as graduate of Beardstown, Illinois High School. His pre-pharmacy college year was taken at Illinois College, Jacksonville. His grade at the School of Pharmacy, University of Illinois, was "A" in every year, in all branches.

The report of the Grading Committee was submitted to the members of the Fairchild Scholarship Committee and all the members voted to accept the report of the Grading Committee.

The chairman desires to thank his colleagues for their support and the members of the Examining and Grading Committee for their helpfulness. It requires time on the part of the latter and thanks are extended.

The award is made on the basis of the highest general average of the candidate.

The winning candidate is Frank Thomas Maher, of the Illinois College of Pharmacy; a sketch of the prize-winner follows.

E. G. EBERLE, *Chairman.*

FRANK THOMAS MAHER.

Frank Thomas Maher, winner of the Fairchild Scholarship for 1937, was born in East St. Louis, Illinois, September 23, 1909. His parents moving to Beardstown, Illinois, young Maher completed his education there, graduating from the Beardstown High School in 1927. Thereafter, he entered the employ of W. S. Denton and E. R. Lewis of Beardstown where he remained for nine years. Mr. Denton is a well-known pharmacist in Illinois, having served for many years as a member of the State Board of Pharmacy and as a member of the Executive Committee of the Illinois Pharmaceutical Association, and afterward, as vice-president and as president of the latter organization.

Mr. Maher was employed by Ray Steinheimer, pharmacist of Jacksonville, Illinois, for one year while attending Illinois College at Jacksonville, where he took his pre-pharmacy year. He enrolled in the University of Illinois College of Pharmacy in September 1934 and was graduated in June 1937 with high honors, having attained a straight A average throughout the course. He was awarded the Hodel-Saltiel-Hodel Prize for highest

FRANK THOMAS MAHER.

scholarship and was elected to Rho Chi Honorary Pharmaceutical Society, and to the All-University Honorary Society of Phi Kappa Phi.

During his college year he was employed for his spare time in the pharmacies of J. F. Carnegie in the Blackstone Hotel and in the Drake Hotel, Chicago. He passed his examination for registered assistant pharmacist in 1930 and took the examination for registered pharmacist in June 1937. Passing judgment, based on comments of several examiners, Mr. Maher is an excellent student, both in theory and practice.

NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION.

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee.

Manuscripts should be sent to Editor E. G. Eberle, 2215 Constitution Ave., N. W., Washington, D. C.

All manuscripts should be typewritten in double spacing on one side of paper $8^1/_2$ x 11 inches, and should be mailed in a flat package—not rolled. The original (*not* carbon) copy should be sent. The original drawings, not photographs of drawings, should accompany the manuscript. Authors should indicate on the manuscript the approximate position of text figures. All drawings should be marked with the author's name and address.

A condensed title running page headline, not to exceed thirty-five letters, should be given on a separate sheet and placed at the beginning of each article.

The method of stating the laboratory in which the work is done should be uniform and placed as a footnote at end of first page, giving Department, School or College. The date when received for publication should be given.

Numerals are used for figures for all definite weights, measurements, percentages, and degrees of temperature (for example: 2 Kg., 1 inch, 20.5 cc., 300° C.). Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example: one hundred years ago, about two and one-half hours, seven times).

Standard abbreviations should be used whenever weights and measures are given in the metric system, *e. g.*, 10 Kg., 2.25 cc., etc. The forms to be used are: cc., Kg., mg., mm., L. and M.

Figures should be numbered from 1 up, beginning with the text-figures (line engravings are always treated as text-figures and should be designed as such) and continuing through the plates. The reduction desired should be clearly indicated on the margin of the drawing. All drawings should be made with India ink, preferably on white tracing paper or cloth. If coördinate paper is used, a blue-lined paper must be chosen. Usually it is desirable to ink in the large squares so that the curves can be more easily read. Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches). Photographs intended for half-tone reproduction should be securely mounted with colorless paste.

"Figure" should be spelled out at the beginning of a sentence; elsewhere it is abbreviated to "Fig.;" per cent—2 words.

The expense for a limited number of figures and plates will be borne by the JOURNAL; expense for cuts in excess of this number must be defrayed by the author.

References to the literature cited should be grouped at the end of the manuscript under the *References*. The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full-sized figures included in parentheses). The sequence followed in the citations should be: Author's name (with initials), name of publication, volume number, page number and the date in parentheses. Abbreviations for journals should conform to the style of *Chemical Abstracts*, published by the American Chemical Society.

(1) Author, A. Y., *Am. J. Physiol.*, 79, 289 (1927).

Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION's annual meeting become the property of the Association and may at the discretion of the Editor be published in the JOURNAL. Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The Editor will appreciate comments from Board of Review and Committee on Publication, members, authors and others interested.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1936–1937.

Office of the Secretary, 2215 Constitution Avenue, Washington, D. C.

LETTER NO. 16.

July 2, 1937.

To the Members of the Council:

111. Use of the Text of the N. F. VI. Motion No. 52 (Council Letter No. 15, page 669) has been carried and the Chicago Medical Book Company has been so advised.

112. Proposed Publication. Motion No. 53 (Council Letter No. 15, page 669) has been carried, and the Chairman of the Committee on Publications has been so advised.

113. Election of Members. Motion No. 54 (Council Letter No. 15, page 670) has been carried, and applicants for membership numbered 389 to 408, inclusive, are declared elected.

114. Committee on U. S. Pharmacopœia. Chairman Cook of the U. S. P. Committee on Revision and Chairman Gathercoal of the A. PH. A. Committee on N. F. have requested to be relieved from membership on this Committee, and President Beal has appointed Frank O. Taylor, Detroit, Mich., and Arthur P. Markendorf, Louisville, Ky., as members of the Committee to succeed Drs. Cook and Gathercoal.

115. American Documentation Institute. The following letter was addressed to President Beal by President Davis of the Institute, which is located in the building of the American Academy of Sciences:

AMERICAN DOCUMENTATION INSTITUTE.

Board of Trustees: Watson Davis, Science Service; *President:* Robert C. Binkley, Western Reserve University; *Vice-President:* Solon J. Buck, National Archives; *Treas.:* James Thayer Gerould, Princeton University; Ludvig Hektoen, National Research Council; Anne Shively, *Secretary.*

For the promotion and development of documentation in scholarly and scientific fields. Organized 1937 as a non-profit corporation, with members nominated by scholarly and scientific agencies

Address: Offices of Science Service, 2101 Constitution Ave.,
Washington, D. C.

June 15, 1937.

Dr. G. D. Beal, *President*
AMERICAN PHARMACEUTICAL ASSOCIATION
Mellon Institute
Pittsburgh, Pa.

Dear Dr. Beal:

On behalf of the Board of Trustees of the American Documentation Institute, I have the honor of asking whether your organization approves our action in providing that the AMERICAN PHARMACEUTICAL ASSOCIATION shall be a nominating agency for a member of the Institute.

"By having members of American Documentation Institute named by national organizations and institutions in scholarly and scientific fields, it is believed that the Institute will be a democratic organization responsive to changing needs and capable of performing coöperative functions as and when required.

"Your organization's participation by nominating a member every three years will, of course, indicate general approval of the idea of the American Documentation Institute, but the responsibility involved would be limited to that action. There is no possibility of financial or other liability on the part of the nominating agencies or the members nominated.

"Articles of incorporation, by-laws and a statement of objectives are enclosed for your information. I shall be pleased to send any of the reports of conferences, etc., that led up to the formation of the American Documentation Institute that you may not have already received.

"Any further information desired will be supplied to the best of our ability."

The Circular of Information enclosed with the letter is as follows:

CIRCULAR OF INFORMATION.

The American Documentation Institute arose out of the need for a broad, energetic and intellectually motivated development of all phases of documentation, particularly microphotographic duplication and its ramifications, in the fields of physical, natural, social and historical sciences and the general sphere of libraries and information services.

It will take over the function of Science Service's Documentation Division on July 1, 1937. It will operate Bibliofilm Service and the Auxiliary Publication Service. The design and development of microphotographic apparatus carried on by Science Service with the coöperation of the Chemical Foundation, U. S. Navy, Bureau of the Census, Works Progress Administration, etc., has been completed and is now capable of being left in commercial hands.

Bibliofilm Service has served a very useful purpose in the Library of the U. S. Department of Agriculture in substituting for lending. It is planned to extend Bibliofilm Service to operate in coöperation with other Washington libraries so far as possible. Arrangements have been made to serve the Army Medical Library as soon as the necessary camera is available.

The American Documentation Institute hopes to be able to serve as an informational clearing house on microfilming activities in this country and abroad.

Auxiliary publication in coöperation with journals, societies and institutions is contemplated, not only through the use of microfilm, but through the use of other methods of duplication. The American Documentation Institute could act as a mutual operating agency for coöperating agencies.

An investigation is being made into the needs of a document preservation center applying the technique of cellulose sheet lamination, etc., developed by the National Bureau of Standards for the National Archives.

The American Documentation Institute will not engage in the sale and manufacture of apparatus, but will coöperate with all manufacturers and commercial concerns so far as practicable.

The following are the agencies named in the By-Laws to nominate members in the Institute: American Academy of Arts and Sciences, American Anthropological Association, American Association for the Advancement of Science, American Association of Museums, American Association of University Professors, American Astronomical Society, American Bar Association, American Chemical Society, American Council of Learned Societies, American Council on Education, American Dental Association, American Economic Association, American Engineering Council, American Geographical Society, American Historical Association, American Institute of Chemical Engineers, American Institute of Electrical Engineers, American Institute of Mining and Metallurgical Engineers, American Institute of Physics, American Library Association, American Library Institute, American Mathematical Society, American Medical Association, AMERICAN PHARMACEUTICAL ASSOCIATION, American Philological Association, American Philosophical Association, American Philosophical Society, American Political Science Association, American Psychological Association, American Public Health Association, American Society for Testing Materials, American Society of Civil Engineers, American Society of International Law, American Society of Mechanical Engineers, American Sociological Society, American Standards Association, American Statistical Association, Archæological Institute of America, Archivist of the United States, Association of Research Libraries, Bibliographical Society of America, Business History Society, Chairman, Central Statistical Board, U. S. Government, Chemical Foundation, Commissioner of Education, Office of Education, U. S. Government, Federation of American Societies for Experimental Biology, Geological Society of America, Institute of Radio Engineers, Librarian of Congress, Linguistic Society of America, Mediæval Academy of America, Modern Language Association, Mathematical Association of America, National Academy of Sciences, National Geographic Society, National Research Council, Science Service, Secretary of Agriculture, Smithsonian Institution, Social Science Research Council, Society of American Archivists, Society of Automotive Engineers, Society of Motion Picture Engineers, Special Libraries Association, Surgeon General of the Army, Surgeon General of the Navy, Surgeon General of the U. S. Public Health Service, Union of American Biological Societies.

Article 4 of the By-Laws, under Membership, provides "There shall be no dues, fees or assessments paid by the members of this corporation."

President Beal approves of the inclusion of the AMERICAN PHARMACEUTICAL ASSOCIATION

among the organizations and institutions named, as a nominating agency, and requests that the proposal be submitted to the Council for action.

(*Motion No. 55*) It is moved by Kelly that the action of the Board of Trustees of the American Documentation Institute in providing that the AMERICAN PHARMACEUTICAL ASSOCIATION shall be a nominating agency for a member of the Institute, under the conditions set out in President Davis' letter and the accompanying documents, be approved. A vote on this motion will be called for in about ten days.

116. Applicants for Membership. The following applications, properly endorsed and accompanied with the first year's dues, have been received:

No. 409, Boris Lambro Moskoff, 108 Railroad St., Zeigler, Ill.; No. 410, Wm. N. Botts, Jr., Box 575, Appalachia, Va.; No. 411, Lawrence S. Malowaw, Universidad Nacional, Panama City, Panama; No. 412, Geo. E. Wolfe, 13th & Greenup Sts., Covington, Ky.; No. 413, David E. Buckingham, V.M.D., 2115 14th St., N. W., Washington, D. C.; No. 414, Fred J. Bandelin, 261 E. Auburn Ave., Cincinnati, Ohio; No. 415, Ruby B. Owsley, 2800 N. Commerical, Portland, Ore. (Emanuel Hospital); No. 416, James Wm. Daniel, Mt. Sterling, Ky.; No. 417, Charles Liekerman, 26 Broadway, New York, N. Y.; No. 418, Sigmund Kopald, 700 Morris Park Ave., New York, N. Y.; No. 419, Paul Edward Oneacre, 220 Milford St., Clarksburg, W. Va.; No. 420, James Joseph McSorley, 20 E. 190th St., Bronx, N. Y. C.; No. 421, Roderick M. Robertson, Fulton, Ill.; No. 422, Roy Eugene Johnson, 347 W. Broad St.. Hazleton, Pa.; No. 423, Saul Caspe, 215 W. 259th St., New York, N. Y.

(*Motion No. 56*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

E. F. KELLY, *Secretary.*

LETTER NO. 17.

July 13, 1937.

To the Members of the Council:

117. American Documentation Institute. The following comment has been received from A. G. DuMez:

"I have the following comment to make on Item No. 115 of Council Letter No. 16. I believe that the A. PH. A. should be represented on the American Documentation Institute. About a year ago Dr. Seidell talked to me about microphotographic duplication with respect to pharmaceutical abstracts and I had some correspondence with him subsequent to our conversation. I doubt very much if we can afford to participate in this service at this time but I do believe that we should keep in close touch with its development and I know of no better way of doing that than to be represented on the American Documentation Institute."

A vote is called for on Motion No. 55, Council Letter No. 16, preceding.

118. Election of Members. A vote is called for on Motion No. 56, Council Letter No. 16, preceding.

119. Safe Deposit Boxes. When Treasurer Holton took office, he was given the right of access to and control over the contents of Box No. 2, Baltimore Trust Co., now the Baltimore National Bank, Baltimore, Md. (Motion No. 33, Council Letter No. 9, 1935–1936, see A. PH. A. JOURNAL, April 1926, page 308). Recently, Treasurer Holton has found it necessary to use a larger safe deposit box and requests that transfer to Box 371A, Baltimore National Bank, be approved. President Beal, as Chairman of the Committee on Property and Funds, approves the request.

(*Motion No. 57*) It is moved by Kelly that Treasurer Holton be given the right of access to and control over the contents of Box No. 371A, standing in the name of the AMERICAN PHARMACEUTICAL ASSOCIATION, in place of Box No. 2, and that President Beal and the Secretary be authorized to execute a certificate to the Baltimore National Bank for this purpose.

120. Applicants for Membership. The following applications, properly endorsed and accompanied with the first year's dues, have been received:

No. 424, Theodore B. Budd, 3619 Claradon Rd., Brooklyn, N. Y.; No. 425, Francis Vincent Toschia, 86 McDougal St., Brooklyn, N. Y.; No. 426, Sheldon A. Linet, 90–02 Holland Ave., Rockaway Beach, N. Y.; No. 427, Catherine Pauline Bosio, 2363 Arthur Ave., Bronx, N. Y.; No. 428, Robert B. Mackler, 1320 Ave. N., Brooklyn, N. Y.; No. 429, Agnes C. E. Sullivan, 191–12 Hollis Ave., Hollis, N. Y.; No. 430, Harry Leifer, 1500 Prospect Pl., Brooklyn, N. Y.; No. 431,

W. F. Sprague, City Drug Store, Fredonia, Kans.; No. 432, Solomon Miller, 309 N. Arlington Ave., Baltimore, Md.; No. 433, John D. Karagulis, 2963 E. Lafayette, Detroit, Mich.; No. 434, Sister Joseph Marie Schuerman, St. Mary's Hospital, St. Louis, Mo.; No. 435, Winthrop Dorman Hall, Pharmacy Quarters, U. of M. Hospital, Ann Arbor, Mich.; No. 436, Tom R. Ogle, Roecher Drug Co., Bozeman, Mont.; No. 437, John Anthony Hill, Jr., 227 Osgood St., North Andover, Mass.; No. 438, Lazarus Nicholas Lazaropoulos, 10 Fourth St., Ipswich, Mass.; No. 439, Nicholas T. Malouf, 41 Cowing St., West Roxbury, Mass.; No. 440, Romulus De Nicola, 9 Mass. Ave., Quincy, Mass.; No. 441, Raymond Winston Vander Wyk, 118 Chestnut St., Waltham, Mass.; No. 442, Harry James Pratt, 6583 Windsor Ave., Philadelphia, Pa.; No. 443, David I. Cohen, 601 W. Side Ave., Jersey City, N. J.; No. 444, Edward Anzelmi, 115 W. 68th St., New York, N. Y.; No. 445, G. Allen Moulton, Peterborough, N. H.

(*Motion No. 58*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

121. Committee on N. F. and R. B. Policies. Attention is called to the report of this Committee at the Dallas meeting (see Item 191, A. PH. A. JOURNAL, September 1936, page 815) which was referred to the members of the Council for study. In this connection, please also note Item 194, Relation of the N. F. to the Food and Drugs Act, on page 822 of the same issue of the JOURNAL.

122. Laboratory in the American Institute of Pharmacy. The special committee provided for under Motion No. 50, see page 668, Council Letter No. 14, met at the INSTITUTE on call of Chairman Gathercoal on Wednesday, July 14th, with a full attendance. Forenoon and afternoon sessions were held.

E. F. KELLY, *Secretary.*

LETTER NO. 18.

August 2, 1937.

To the Members of the Council:

123. American Documentation Institute. Motion No. 55 (Council Letters No. 16, page 763 and No. 17, page 765) has been carried and President Watson Davis of the Institute has been so advised.

124. Election of Members. Motions No. 56 (Council Letter No. 16, preceding) and No. 58 (Council Letter No. 17, preceding) have been carried, and applicants for membership numbered 409 to 445, inclusive, are declared elected.

125. Safe Deposit Boxes. Motion No. 57 (Council Letter No. 17, preceding) has been carried and the Baltimore National Bank has been advised.

126. Use of Text of N. F. VI. The following communication has been received from Chairman DuMez of the Committee on Publications:

"I have reviewed the request and enclosed manuscript of MacDonald Dick for permission to use portions of the N. F. text in the new Hospital Formulary of Duke University Hospital and find nothing objectionable in the latter. I, therefore, recommend that permission be granted Duke University Hospital to use portions of the N. F. text in the revision of the Hospital Formulary and that no fee be charged therefor."

(*Motion No. 59*) It is moved by DuMez that the Duke University Hospital be granted permission to use portions of the text of N. F. VI in the coming revision of its Hospital Formulary with the usual acknowledgment and for value received.

127. Committee on Council on Pharmaceutical Practice. President Beal has appointed Leonard A. Seltzer and H. K. Whitney as additional members of this Committee (Council Letter No. 4, page 1039, November JOURNAL).

128. General Program of the New York Meeting. The following changes have been made in the tentative program as attached to Council Letter No. 15: (1) A meeting of the A. A. C. P. has been scheduled for Monday evening, August 16th; (2) The Joint Session of the Scientific Section and the Section on Practical Pharmacy and Dispensing on Friday morning, August 20th, has been omitted for this meeting only, with the consent of the officers of both Sections, President Beal and Chairman Hilton, since there were no important reports to come before the Joint Session this year; (3) the Second Session of the Scientific Sections will be held on Friday morning, and the Third Session on Friday afternoon; (4) the members of the Section on Practical Pharmacy and

Dispensing will be free to attend the First Session of the Sub-Section on Hospital Pharmacy on Friday morning.

129. Meeting of the Council. Attached is a copy of the Order of Business for the meeting of the Council on Sunday, August 15th, which will be held in Parlor A, Hotel Pennsylvania, beginning at 9:30 A.M., New York time.

130. Applicants for Membership. The following applications, properly endorsed and accompanied with the first year's dues, have been received:

No. 446, Clarence B. Hay, 716 Front St., Fargo, N. Dak.; No. 447, Otto H. Kuether, 19 N. Broadway St., Herington, Kans.; No. 448, John Gordon Bielawski, 5117 St. Lawrence, Detroit, Mich.; No. 449, Anna McKeon, Bradford Hospital, Bradford, Penna.; No. 450, Salvatore Ingafu, Box 103, Orangeburg, N. Y.; No. 451, Norris Arthur Kessler, 687 Landis St., Memphis, Tenn.; No. 452, Neulon Deahl, Parke, Davis & Co., Detroit, Mich.; No. 453, Wm. James Wolly, 1757 Hobart St., N. W., Washington, D. C.; No. 454, Thompson A. Nooner, 154 Ogden Ave., Jersey City, N. J.; No. 455, Franklin C. Cevela, 342 E. York Ave., West Chicago, Ill.; No. 456, Herman Buckbinder, 142 Erie St., Jersey City, N. J.; No. 457, Arthur T. Schreiber, 234 W. Broadway, Louisville, Ky.; No. 458, Gustav E. Cwalina, 843 E. Eager St., Baltimore, Md.; No. 459, Howard B. Fonda, Burroughs, Wellcome & Co., Tuckahoe, N. Y.; No. 460, John O. Radenbaugh, 30 Mary Day, Pontiac, Mich.; No. 461, Charles Robert Seward, 1151 So. Oakland Ave., Pasadena, Calif.; No. 462, Edwin J. Boberg, Eau Claire, Wis.; No. 463, Lucien H. LeMaitre, 27 Smith Ave., Ware, Mass.; No. 464, Alice H Hayden, 265 Northern Ave., Boston, Mass.

(*Motion No. 60*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

131. Joint Meeting Executive Committee of the N. A. R. D. and Council of the A. Ph. A. In accordance with the usual arrangement, this meeting will be held during the New York meeting of the A. PH. A. Secretary Dargavel of the N. A. R. D. has accepted the invitation for the members of the Executive Committee to meet with the members of the Council on Wednesday afternoon, August 18th, at 2:30 P.M., in Parlor A, Hotel Pennsylvania. A meeting of the Council is scheduled at that time and can be continued after the program of the Joint Meeting is completed.

E. F. KELLY, *Secretary*.

Dinner of the Former Presidents, AMERICAN PHARMACEUTICAL ASSOCIATION, Hotel Pennsylvania, New York, N. Y.; August 20, 1937.

Left to Right and Around the Tables: Mrs. R. P. Fischelis; P. H. Costello; Mrs. George D. Beal; R. L. Swain; Mrs. W. D. Adams; H. C. Christensen; Mrs. H. V. Arny; C. W. Holton; Mrs. W. B. Day; J. A. Koch; Mrs. H. M. Whelpley; C. H. Packard; Mrs. J. H. Beal; E. G. Eberle; J. H. Beal; Wm. B. Day; Mrs. E. G. Eberle; S. L. Hilton; Mrs. J. G. Godding; H. V. Arny; Mrs. C. H. Packard; C. W. Johnson; Mrs. J. A. Koch; W. D. Adams; Mrs. C. W. Holton; R. P. Fischelis; E. F. Kelly; Geo. D. Beal; Mrs. P. H. Costello.

LIST OF REGISTRANTS, 85TH ANNUAL MEETING, A. PH. A., NEW YORK CITY.

Corrections and additions are respectfully requested; a number evidently failed to sign the official Registration Book; the names are given as recorded. Please address JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION, 2215 Constitution Ave., N. W., Washington, D. C.

ABEND, CARL A., Detroit, Mich.
ABRAHAMSEN, ED., MR. AND MRS., Ridgefield, N. J.
ACTON, M. G., JR., Bronxville, N. Y.
ADAMS, WALTER D., MR. AND MRS., Forney, Texas.
ADOLPH, EDWARD H., Elmhurst, L. I., N. Y.
ALSTODT, BERL S., Jamaica, L. I., N. Y.
ALTMAN, EDWARD M., Providence, R. I.
AMSTERDAM, HERMAN J., MR. AND MRS., Brooklyn, N. Y.
ANDREWS, M. J., MR. AND MRS., Baltimore, Md.
ANDREWS, MRS. W. F., New York City.
ARNOLD, FRANK W., MR. AND MRS., Rye, N. Y.
ARNOLD, H. C., MR. AND MRS., Floral Park, N. Y.
ARNY, H. V., MR. AND MRS., New York City.
ATKINSON, J. M., Columbia, S. C.

BACON, ALICE, MISS, Chagrin Falls, O.
BACON, FRANKLIN J., MR. AND MRS., Chagrin Falls, O.
BALL, ARTHUR D., Rutherford, N. J.
BALLARD, MR. AND MRS., Mt. Vernon, N. Y.
BALLEW, J. G., Lenoir, N. C.
BANG, HAAKON, Pullman, Wash.
BANNON, HENRY J., Webster Groves, Mo.
BARRETT, LESLIE B., MR. AND MRS., New Haven, Conn.
BARTHEN, CHARLES L., South Orange, N. J.
BARTLETT, K. A., E. Orange, N. J.
BATTISTA, JOSEPH V., Brooklyn, N. Y.
BAUER, JOHN C., Baltimore, Md.
BAUER, SISTER M. LUDMILLA, St. Louis, Mo.
BEACH, DEMOTT C., Leonia, N. J.
BEAL, GEORGE D., MR. AND MRS., Pittsburgh, Pa.
BEAL, GEORGE D., JR., Pittsburgh, Pa.
BEAL, JAMES H., MR. AND MRS., Fort Walton, Fla.
BEAL, MARJORIE D., Pittsburgh, Pa.
BEALS, ERNEST L., MR. AND MRS., Pocatello, Idaho.
BEARD, J. G., MR. AND MRS., Chapel Hill, N. C.
BECKER, H. E., Brooklyn, N. Y.
BECKER, IRWIN A., Chicago, Ill.
BELL, MRS. J. B., Roanoke, Va.
BELLIS, E. S., Mt. Vernon, N. Y.
BERG, F. F., Floral Park, N. Y.
BERGSTROM, MRS. ELLA, Cooperstown, N. Dak.
BERGY, G. A., Morgantown, W. Va.
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BIBBINS, MISS RUTH, Indianapolis, Ind.
BILHUBER, E. A., Jersey City, N. J.
BINDER, CAROLYN, Oak Park, Ill.
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BLACK, C. L., Greensboro, N. C.
BLAKE, L. S., Auburn, Ala.
BLAU, JOSEPH, Bronx, N. Y.
BLOUNT, MRS. C. W., Buchanan, Va.
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BOHN, HERBERT, Indianapolis, Ind.
BONISTEEL, WM. J., Scarsdale, N. Y.
BOSEE, ROLAND A., Baldwin, L. I., N. Y.
BOWEN, MRS. LILLIAN, Chicago, Ill.
BOWERS, HAROLD ROSS, Beverly Hills, Calif.
BOYER, MRS. G. C., Pittsburgh, Pa.
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BREESE, MURRAY, New York City.
BRENNER, URSULA, Flushing, N. Y.
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BRILLHART, RUSSELL E., Des Moines, Iowa.
BRODKIN, MORRIS, MR. AND MRS., Bronx, N. Y.
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BROOKE, DON A., MR. AND MRS., Hastings, Nebr.
BROWN, CLARENCE M., Columbus, O.
BROWN, HENRY, MR. AND MRS., Scranton, Pa.
BROWN, LEWIS N., E. Rutherford, N. J.
BRUCE, HALLIE F., Minneapolis, Minn.
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CANIS, O. P. M., Ozone Park, L. I., N. Y.
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CARTER, H. M., New York City.
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CHRISTENSEN, H. C., Chicago, Ill.
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CLARK, RALPH W., MR. AND MRS., Madison, Wis.
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CLEMMER, JOHN K., Miami Beach, Fla.
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COLLE, BERNARD, New York City.
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CORCORAN, JOHN J., Brooklyn, N. Y.
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COSTELLO, P. H., MR. AND MRS., Cooperstown, N. Dak.
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COUSINS, WALTER H., Dallas, Texas.
CRAIG, HUGH, New York City.
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CURRY, GORDON L., Louisville, Ky.

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DUFFY, ANN, Pittsburgh, Pa.
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ENGELKING, GRACE E., Orange Grove, Texas.
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EVANS, ROSTTON, Warrenton, Ga.

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FORAN, RALPH R., Rahway, N. J.
FORD, M. N., Columbus, O.
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FRANZ, J. J., New York City.
FRANZ, SADYE S., New York City.
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FREERICKS, GRETCHEN, Cincinnati, O.
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GAYLE, J. W., Frankfort, Ky.
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GERSTNER, ROBERT R., New York City.
GERWE, E. G., Cincinnati, O.
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GOECKEL, HENRY J., MR. AND MRS., Cranford, N. J.
GOLDIN, WILLIAM, Teaneck, N. J.
GOLDMAN, PERCY, MR. AND MRS., Brooklyn, N. Y.
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GOLDSMITH, MAURICE, Boston, Mass.
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GOORLEY, JOHN T., Tuckahoe, N. Y.
GRAHAM, KATHERINE, Chicago, Ill.
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GRANT, ELINOR F., Newtonville, Mass.
GRAY, WILLIAM, Chicago, Ill.
GREEN, MELVIN W., Pittsburgh, Pa.
GREENBERG, BEN, New York City.
GREENE, VALENTINE, Jersey City, N. J.
GRIFFITH, INA, Norman, Okla.
GRIFFITH, IVOR, Elkins Park, Pa.
GRIPPRATH, BERT E., Brooklyn, N. Y.
GROSSER, ELEANOR G., Brooklyn, N. Y.
GROTE, I. W., Chattanooga, Tenn.
GUSTAFSON, CARROLL B., West Newton, Mass.
GUSTAFSON, CHARLES, Hartford, Conn.

HAAG, H. B., Richmond, Va.
HALPER, C. H., New York City.
HAMMOND, ELMER L., University, Miss.
HANCOCK, DESSIE, Baltimore, Md.
HANCOCK, JAMES E., Baltimore, Md.
HANSEN, R. J., MR. AND MRS., Muskegon, Mich.
HARDT, R. A., New York City.
HARNIST, M. J., Brooklyn, N. Y.
HARRIS, LOYD E., MR. AND MRS., Norman, Okla.
HART, FANCHON, New York City.
HAUCK, RUDOLF O., MR. AND MRS., Jersey City, N. J.
HAY, CLARENCE B., Fargo, N. Dak.
HAYDEN, ALICE H., La Fayette, Ind.
HAYMAN, ALICE M., Morgantown, W. Va.
HAYMAN, J. LESTER, MR. AND MRS., Morgantown, W. Va.
HEIN, ELIZABETH, San Antonio, Texas.
HEIN, HENRY, San Antonio, Texas.
HEIN, HENRY F., MR. AND MRS., San Antonio, Texas.
HEIMERZHEIM, CHARLES E., Brooklyn, N. Y.
HELMS, SAMUEL T., Baltimore, Md.
HENDERSON, CATHERINE A. D., Brooklyn, N. Y.
HENRY, ALICE, Grand Rapids, Mich.
HENRY, M. NORTON, MR. AND MRS., Lowell, Mich.
HERBINE, R. H., East Orange, N. J.
HERBST, WILLIAM P., MR. AND MRS., Washington, D. C.
HERRIN, HAROLD M., Winder, Ga.
HEWITT, H. G., Williamsville, N. Y.
HILLIARD, J. ALFRED, Valhalla, N. Y.
HILTON, SAMUEL L., Washington, D. C.
HOCH, J. HAMPTON, MRS. AND MRS., Charleston, S. C.
HOGSTAD, ANTON, JR., Westfield, N. J.
HOLMES, T. R., MR. AND MRS., Great Neck, N. Y.
HOLSENDORF, B. E., MR. AND MRS., St. George, S. I., N. Y.
HOLTON, C. W., MR. AND MRS., Essex Fells, N. J.
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HOSKINS, T. W., Louisville, Ky.
HOUCK, RUDOLF O., MR. AND MRS., Jersey City, N. J.
HOUSER, DAN W., MR. AND MRS., Detroit, Mich.
HUBBARD, W. S., White Plains, N. Y.
HUNSBERGER, AMBROSE, MR. AND MRS., Philadelphia, Pa.
HUNT, BEATRICE R., Chicago, Ill.
HUNT, MAYBLE, Oklahoma City, Okla.
HUNT, WILLIAM H., MR. AND MRS., Chicago, Ill.
HUSA, WILLIAM J., MR. AND MRS., Gainesville, Fla.
HUSA, WILLIAM J., JR., Gainesville, Fla.
HUTCHINS, HAROLD, New York City.
HUTCHINSON, J. W., Lexington, Ky.

IACOM, A. M. DELLS, Brooklyn, N. Y.
INGRAM, CHAUNCEY, MR. AND MRS., New York City.
INGRAM, PETER T., New York City.
IRELAND, EDWARD J., Gainesville, Fla.
IRIZARRY, LOPEZ, San Juan, P. R.

JACOBS, F. A., Toronto, Can.
JACOBS, M. L., MR. AND MRS., Chapel Hill, N. C.
JACOBSON, A. R., MR. AND MRS., Yonkers, N. Y.
JAMES, ARTHUR E., West Chester, Pa.
JANARO, WALTER A., MR. AND MRS., New York City.
JANSEN, ELSIE, New York City.
JARRETT, WM. A., Omaha, Nebr.
JELINEK, J. P., MR. AND MRS., St. Paul, Minn.
JENKINS, GLENN L., Minneapolis, Minn.
JESTER, J. WILLARD, Philadelphia, Pa.
JOHNSON, C. W., Seattle, Wash.
JOHNSON, FREDERICK F., Seattle, Wash.
JOHNSON, HENRY S., New Haven, Conn.
JONES, EMMETTE, Norman, Okla.
JONES, GEORGE R., Archer, Fla.
JONES, L. F., MR. AND MRS., Indianapolis, Ind.
JONES, ROBERT B., Luzerne, Pa.
JONES, ROWLAND, JR., Washington, D. C.
JOPPI, THEODORE G., MR. AND MRS., New York City.
JORDAN, C. B., MR. AND MRS., La Fayette, Ind.

KAIRIS, ELEANOR M., Baltimore, Md.
KANTNER, L. M., MR. AND MRS., Baltimore, Md.
KAUFMAN, ABRAHAM, New York City.
KEALE, MRS. ELSIE M., Garden City, L. I., N. Y.
KEALEY, ROBERT C., Jeannette, Pa.
KEBLER, L. F., MR. AND MRS., Washington, D. C.
KELLEY, RAY S., MR. AND MRS., Newton Highlands, Mass.
KELLY, E. F., Washington, D. C.
KELLY, KENNETH L., Washington, D. C.
KENDIG, H. EVERT, Chestnut Hill, Philadelphia, Pa.
KENNEY, MRS. R. J., Columbus, O.
KERN, IRVING, Brooklyn, N. Y.
KIDDER, JAMES H., MR. AND MRS., New York City.
KIDDER, JEROME, New York City.
KIDDER, MARIANNE, New York City.
KIMMEL, V. P., Brooklyn, N. Y.
KING, F. H., Delphos, O.
KING, MISS M., Philadelphia, Pa.
KIRSCH, WILLIAM E., Philadelphia, Pa.
KLEMME, CARL J., W. Lafayette, Ind.
KOCH, CHRIS, Narberth, Pa.
KOCH, J. A., MR. AND MRS., Pittsburgh, Pa.
KONNERTH, RUDOLPH A., Forest Hills, N. Y.
KRANTZ, JOHN C., JR., Baltimore, Md.
KREMERS, EDWARD, Madison, Wis.
KREUER, RALPH R., MR. AND MRS., Pittsburgh, Pa.
KRUSEN, WILMER, Philadelphia, Pa.
KUETHER, OTTO H., MR. AND MRS., Herington, Kans.
KUEVER, R. A., MR. AND MRS., Iowa City, Iowa.
KUKEE, DAVID, Chicago, Ill.

LAKEY, R. T., MR. AND MRS., Detroit, Mich.
LANWERMEYER, CHARLES F., Waukegan, Ill.
LASALLE, J. NORMAN, Providence, R. I.
LASCOFF, F. D., MR. AND MRS., New York City.
LASCOFF, J. LEON, MR. AND MRS., New York City.
LASTAR, MRS. HELEN, Flushing, N. Y.

LAUFFER, JACOB, Brooklyn, N. Y.
LAUVE, A. P., New Orleans, La.
LAWALL, CHARLES H., Philadelphia, Pa.
LEE, C. O., W. Lafayette, Ind.
LEE, JOHN W., Washington, D. C.
LEECH, PAUL N., Winnetka, Ill.
LEHMAN, ROBERT S., Brooklyn, N. Y.
LEMON, A. B., Buffalo, N. Y.
LEWIS, HOWARD B., Ann Arbor, Mich.
LEWITUS, VICTOR, New York City.
LIBERMAN, SAMUEL S., Brooklyn, N. Y.
LICHTIN, AARON, Philadelphia, Pa.
LIGORIO, COSMO, Brooklyn, N. Y.
LITTLE, ERNEST, MR. AND MRS., New Brunswick, N. J.
LITTLEFIELD, VANCE R., Rutherford, N. J.
LLOYD, GEORGE W., MR. AND MRS., Spencer, S. Dak.
LLOYD, J. T., Cincinnati, O.
LOCKE, W. E., Richmond, Va.
LOCKIE, LAURENCE D., Kenmore, N. Y.
LORING, E. B., Fallon, Nev.
LOVELAND, PRESCOTT R., Trenton, N. J.
LUDWIG, ANDREW F., Baltimore, Md.
LYMAN, D. S., MR. AND MRS., Evanston, Ill.
LYMAN, R. A., Lincoln, Nebr.
LYNN, E. V., MR. AND MRS., Boston, Mass.

MCCABE, R. L., Detroit, Mich.
MCCLOSKEY, JOHN F., New Orleans, La.
MCDONNELL, JOHN N., Jenkintown, Pa.
MCDONNELL, JOSEPH F., JR., Jenkintown, Pa.
MCDUFFIE, ROGER A., Greensboro, N. C.
MCMURRAY, R., Columbus, O.
MCMURRAY, R. L., Toronto, O.
MCQUADE, JERRY, New York City.
MCSORLEY, JAMES, New York City.
MACHENDORF, ARTHUR P., MR. AND MRS., Louisville, Ky.
MAGID, LOUIS, Reading, O.
MAIER, A. A., New Haven, Conn.
MALAKOFF, MILTON S., Sunnyside, N. Y.
MANCHEY, L. L., New York City.
MANDELL, FRANK, MR. AND MRS., Flushing, L. I., N. Y.
MANSFIELD, WILLIAM, Delmar, N. Y.
MARKENDORF, A. P., MR. AND MRS., Louisville, Ky.
MARQUIER, ADOLPH F., Newark, N. J.
MARSHALL, T. C., Atlanta, Ga.
MASON, DAVID J., Bronx, N. Y.
MATOUSEK, JOSEPH T., MR. AND MRS., Cleveland, O.
MATOUSEK, MARY AGNES, Cleveland, O.
MELVIN, M. B., Raleigh, N. C.
MEUSER, E. N., Saskatoon, Can.
MEYER, MARY V., Cincinnati, O.
MIALE, JOSEPH P., MR. AND MRS., Brooklyn, N. Y.
MILLER, LLOYD C., McLean, Va.
MILLIGAN, MRS. NED, Oklahoma City, Okla.
MILLIMAN, MORTON, New York City.
MILLS, DORIS M., Lincoln, Nebr.
MILLS, LUCILLE M., Lincoln, Nebr.
MORDELL, J. SOLON, Syracuse, N. Y.
MORRISON, S. W., Oak Park, Ill.
MOTLEY, E. T., MR. AND MRS., Columbia, S. C.
MOULTON, GEORGE A., MR. AND MRS., Peterboro, N. H.
MULDOON, HUGH C., Pittsburgh, Pa.
MULVEY, HARRY R., New York City.
MUNCH, JAMES C., MR. AND MRS., Lansdowne, Pa.
MURDOCK, BURTON K., Kennebunk, Me.
MYERS, MRS. FRANK, Apache, Okla.

NEVEN, JULIUS O. E., Brooklyn, N. Y.
NEWCOMB, E. L., Montclair, N. J.
NEWTON, H. C., MR. AND MRS., Boston, Mass.
NEWTON, LOIS, Wellesley Hills, Mass.
NEWTON, MYRBEL, Wellesley Hills, Mass.
NICHOLS, ADLEY B., Lansdowne, Pa.
NICKEL, KAY, Pittsburgh, Pa.
NILES, EDWARD H., MR. AND MRS., Indianapolis, Ind.
NILES, RICHARD, Indianapoli Ind.
NINGER, FRED C., Wood-Ridge, N. J.
NOEL, H. S., MR. AND MRS., Indianapolis, Ind.
NOLAN, JAMES, Brookline, Mass.
NORDLINGER, STEPHEN L., New York City.

O'CONNELL, C. LEONARD, Pittsburgh, Pa.
O'FARRELL, L. R., Scarsdale, N. Y.
OHMART, LESLIE M., W. Medford, Mass.
ORIFICE, VICTOR M., New York City.
OSOL, ARTHUR, MR. AND MRS., Philadelphia, Pa.
OSTROFSKY, FRANK, MR. AND MRS., Bridgeport, Conn.

PACKARD, C. H., MR. AND MRS., E. Boston, Mass.
PASTERNACKI, J. G., Virginia, Minn.
PATTERSON, FRANK H., MR. AND MRS., Hawesville, Ky.
PECK, BENJAMIN S., MR. AND MRS., Kalamazoo, Mich.
PENICK, S. B., New York City.
PETRO, KELSEY H., Topeka, Kans.
PHILLIPS, ROY E., MR. AND MRS., San Antonio, Texas.
PHILLIPS, WENDELL, San Antonio, Texas.
PILCHARD, J. B., Harrisburg, Pa.
PITTENGER, PAUL S., MR. AND MRS., Philadelphia, Pa.
PLAXCO, J. M., MR. AND MRS., Due West, S. C.
POKORNY, FRANK J., MR. AND MRS., Bayshore, L. I., N. Y.
POWE, C. E., Hartsville, S. C.
POWERS, JUSTIN L., MR. AND MRS., Ann Arbor, Mich.
PRATT, HARRY J., Philadelphia, Pa.
PRIMALE, JOSEPH, Brooklyn, N. Y.
PROCHASKA, E. J., Pine City, Minn.

RAABE, MARY RUTH, Ada, O.
RAABE, R. H., MR. AND MRS., Ada, O.
REAMER, I. T., Durham, N. C.
REDFIELD, D. H., Shenandoah, Iowa.
REED, HOWARD L., Boston, Mass.
REES, R. T., Washington, D. C.
REIF, E. C., Pittsburgh, Pa.
REINDOLLAR, W. F., MR. AND MRS., Baltimore, Md.
RENNICK, DAN, New York City.
REYNOLD, HARRY A., White Plains, N. Y.
RICE, ROBB V., Pittsburgh, Pa.
RIDER, T. H., Chicago, Ill.
RIPPARGER, SISTER M. BERENICE, St. Louis, Mo.
RISING, L. W., Seattle, Wash.
RIVARD, ADOLPHE L., MR. AND MRS., Lewiston, Me.
RIVARD, W. HENRY, Providence, R. I.
RODMAN, ROBERT WILLIAM, New York City.
ROEG, LOUIS M., Rahway, N. J.
ROGERS, CHARLES H., Minneapolis, Minn.
ROGERS, JOHNSON, New York City.
ROLLER, EMIL, New York City.
ROSE, I. W., MR. AND MRS., Chapel Hill, N. C.
ROSE, LEONARD, Bronx, N. Y.
ROSIN, JOSEPH, Plainfield, N. J.
ROTHROCK, R. B., Evansville, Ind.
ROWE, L. W., Detroit, Mich.
ROWLAND, LESLIE W., Philadelphia, Pa.
RUDD, WORTLEY F., Richmond, Va.
RUSSELL, JAMES D., Detroit, Mich.
RYAN, MRS. J. A., Columbus, O.
RYAN, THOMAS J., MR. AND MRS., Columbus, O.
RYLANDS, T. F., Chicago, Ill.

SAALBACH, LOUIS, Pittsburgh, Pa.
SASSE, H. A., MR. AND MRS., Redfield, S. Dak.
SAVITZ, GERALD S., Philadelphia, Pa.
SAWYER, JOHN R., MR. AND MRS., Jamaica Plain, Mass.
SCHAEFER, F. C. A., MR. AND MRS., Brooklyn, N. Y.
SCHAEFER, HUGO H., MR. AND MRS., Yonkers, N. Y.
SCHICKS, GEORGE C., MR. AND MRS., Upper Montclair, N. J.
SCHLOTTERER, RAY, New York City.
SCHRAM, W. H., Hillsboro, N. D.
SCHROEDER, FREDERICK, Brooklyn, N. Y.
SCHROEDER, GEORGE, MR. AND MRS., New York City.
SCHULBERG, LOUIS J., MR. AND MRS., Brooklyn, N. Y.
SCOVILLE, WILBUR L., MR. AND MRS., Gainesville, Fla.
SEDAN, CARL G., Detroit, Mich.
SEDLEY, NAT, New York City.
SELEY, JACOB, Brooklyn, N. Y.
SENSTT, H. G., Buffalo, N. Y.
SETARO, JOSEPH J., MR. AND MRS., L. I. C., N. Y.
SHANGRAW, W. B., MR. AND MRS., Rutland, Vt.
SHKOLNIK, SAMUEL, MR. AND MRS., Chicago, Ill.
SIEGEL, BERTHA, Bronx, N. Y.
SIEGEL, JULIUS, MR. AND MRS., New York City.
SIMONSEN, MRS. E., Jefferson City, Mo.
SIMPSON, CHARLES H., New York City.
SISSON, O. U., Chicago, Ill.
SIVENSON, CARLITA, Philadelphia, Pa.
SKEELS, H. M., Reno, Nev.
SLATER, S., MR. AND MRS., New York City.
SLOANE, WILLIAM A., MR. AND MRS., S. Pasadena, Calif.
SLOCUM, J. W., MR. AND MRS., Indianola, Iowa.
SMITH, D. H., Washington, D. C.
SMITH, THOMAS S., Wilmington, Del.
SMITH, W. B., Richmond, Va.
SNYDER, J. P., Norwich, N. Y.
SNYDER, R. K., Chicago, Ill.
SOMMER, ISIDOR L., MR. AND MRS., Brooklyn, N. Y.
SONNENBURG, AMELIA A., Baltimore, Md.
SOVEL, L. S., Pittsburgh, Pa.
SPEASE, EDWARD, MR. AND MRS., Cleveland, O.
SPENCER, D. H., Lawrence, Kans.
SPIVAK, JOSEPH, New York City.
SPRAGUE, W. F., MR. AND MRS., Fredonia, Kans.
SRAON, CARL G., Detroit, Mich.

STANBURY, R. B. J., Toronto, Can.
STARKMAN, M. A., Toronto, Can.
STAUBER, ROBERT A., Auburn, N. Y.
STEIGER, LEONARD W., Hackensack, N. J.
STEVENS, ASA N., Indianapolis, Ind.
STOCKING, C. H., MR. AND MRS., Ann Arbor, Mich.
STROTHER, W. D., MR. AND MRS., Columbia, S. C.
STROUP, FREEMAN P., Philadelphia, Pa.
SUTTLEMYRE, PHILIP, Hickory, N. C.
SUTTLEMYRE, P. J., Hickory, N. C.
SWAIN, ROBERT L., Baltimore, Md.
SWANSON, E. E., Indianapolis, Ind.
SWENSON, CARLITA, Philadelphia, Pa.
SWISHER, MARGARET C., Buffalo, N. Y.
SWORNIGEN, DEWITT C., MR. AND MRS., China Grove, N. C.

TAUB, ABRAHAM, New York City.
TAYLOR, AUGUSTUS C., MR. AND MRS., Washington, D. C.
TAYLOR, FRANK O., Detroit, Mich.
TEETERS, WILBER J., Iowa City, Iowa.
TERRY, R. E., Elmhurst, Ill.
THOMAS, A. E., MR. AND MRS., Des Moines, Iowa.
THOMPSON, DOLORES, Catonsville, Md.
THOMPSON, DOROTHY, Catonsville, Md.
THOMPSON, LEON H., Cambridge, Mass.
THOMPSON, M. R., MR. AND MRS., Baltimore, Md.
THORPE, MELVIN A., St. Louis, Mo.
TICE, L. F., Salem, N. J.
TOON, PHYLLIS A., W. Roxbury, Mass.
TRYWUSCH, LOUIS, New York City.
TRYWUSCH, SELMA, New York City.
TULLAR, PAUL E., White Plains, N. Y.

UHL, A. H., Madison, Wis.
ULMER, CHESTER I., Gibbstown, N. J.
URDANG, DR. GEORGE, Berlin, Germany.

VAN ITALLIE, PHILIP H., New York City.
VAN SCHAACK, Mrs. C. P., Wilmette, Ill.
VARNUM, WALTER H., MR. AND MRS., Lawrence, Kans.
VICHER, EDWARD E., Berwyn, Ill.
VIEHOEVER, ARNO, Swarthmore, Pa.
VOGLER, H. A., St. Louis, Mo.
VOGT, HENRY A., White Plains, N. Y.

WAKEMAN, HATTIE, Madison, Wis.
WAKEMAN, NELLIE, Madison, Wis.
WALLACE, LEW, Laurel, Miss.
WARD, JUSTUS C., MR. AND MRS., Denver, Colo.
WARD, NANCY JOAN, Denver, Colo.
WARREN, L. E., Chevy Chase, Md.
WATTS, MRS. NELLIE P., Philadelphia, Pa.
WEISWASSER, VAT, New York City.
WENDT, WILLIAM C., Columbus, O.
WHELPLEY, MRS. H. M., St. Louis, Mo.
WHITE, ALFRED J., New York City.
WHITNEY, HARVEY A. K., MR. AND MRS., Ann Arbor, Mich.
WIETERS, MISS D., Charleston, S. C.
WILCOX, WAYLAND D., MR. AND MRS., Philadelphia, Pa.
WILEY, JAMES H., Tuckahoe, N. Y.
WILIK, JOHANNA, Fargo, N. D.
WILSON, CHARLES E., Corinth, Miss.
WILSON, R. C., MR. AND MRS., Athens, Ga.
WIMMER, CURT P., MR. AND MRS., New York City.
WIMMER, DOROTHY, Forest Hills, N. Y.
WINNE, A. L. I., MR. AND MRS., Richmond, Va.
WIRTH, ELMER H., Chicago, Ill.
WIRTH, MARILYN, Chicago, Ill.
WITT, EWALD, Washington, D. C.
WOHLMAN, ELLA, New York City.
WRIGHT, JOHN H., New York City.

YOUNG, IMOGENE, Mineral Ridge, O.
YOUNGKEN, EUGENE, Arlington, Mass.
YOUNGKEN, HEBER W., MR. AND MRS., Arlington, Mass.

ZEIGLER, W. H., Charleston, S. C.
ZOELLER, E. V., Tarboro, N. C.
ZONIES, NATHAN, Philadelphia, Pa.
ZONIES, SELDIA, Philadelphia, Pa.
ZOPF, LOUIS C., MR. AND MRS., Iowa City, Iowa.
ZUFALL, C. J., MR. AND MRS., W. Lafayette, Ind.

RESOLUTIONS AND RECOMMENDATIONS ADOPTED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION AT ITS EIGHTY-FIFTH ANNUAL MEETING IN NEW YORK CITY, AUGUST 16–21, 1937, UPON RECOMMENDATION OF THE HOUSE OF DELEGATES THROUGH THE COMMITTEE ON RESOLUTIONS.

ADDRESS OF PRESIDENT GEORGE D. BEAL.

The AMERICAN PHARMACEUTICAL ASSOCIATION expresses its appreciation of the unusual service rendered by President Beal during his term of office and for his comprehensive and thought-provoking presidential address.

No. 1. Plan for Visitation to Branches of the Association.

Based on Recommendation No. 1 in the President's Address—

Resolved, that the ASSOCIATION instruct the Council to work out a plan by which each Branch—local, student or prospective—be visited by the President, a Vice-President or the Secretary each year.

No. 2. Encouragement of Closer Relationship.

Based on Recommendation No. 2 in the President's Address—

Resolved, that it is the sense of this group that pharmaceutical conferences having for their intention the development of a closer relationship between the practicing pharmacist and the colleges should be encouraged.

No. 3. Study of Relationships between the House of Delegates and the State Associations.

Based on Recommendation No. 1 in the address of the Chairman of the House of Delegates.

Resolved, that a committee of five be appointed to study the relationships that exist among the three bodies whose members constitute the ASSOCIATION; that is, the House of Delegates, the Council, and the general body (A. PH. A.), and further to promote a closer relationship between the House of Delegates and the State Associations.

No. 4. Study Plans for Coördinating Pharmaceutical Interests.

Based on Recommendation No. 2 in the address of the Chairman of the House of Delegates—

Resolved, that a committee be appointed to study possible ways of coördinating the activities of the various pharmaceutical interests toward definite objectives and thus obviate to a considerable degree the energy waste caused by a lack of a proper coördinating agency.

No. 5. Distribution of Medicaments through Retail Pharmacies.

WHEREAS, the essential professional function of the pharmacist is the purveying of drugs and medicines to physicians and their patients, and

WHEREAS, present trends indicate an increasing tendency to omit the pharmacist as the ultimate distributor of drugs to physicians and the laity

Therefore Be It Resolved, that the ASSOCIATION strongly urge all governmental agencies to distribute necessary medicaments to the public through the medium of retail pharmacies.

No. 6. Dissatisfaction with Non-Enactment of Food, Drug and Cosmetic Legislation by Congress.

Resolved, that the ASSOCIATION express its profound dissatisfaction with the failure of Congress to enact food, drug and cosmetic legislation based upon a sound understanding of public health and designed to give the public adequate and immediate protection against adulteration of drugs, foods and cosmetics, and against all forms of misbranding and misstatement in labels and all forms of advertising.

No. 7. Approval of Efforts by U. S. Public Health Service.

Resolved, that the ASSOCIATION expresses its whole-hearted approval of the efforts of the United States Public Health Service, under the direction of Surgeon General Parran, to awaken public interest in the predominance of venereal disease, and to develop public support of plans and means of eradicating this great public health scourge.

No. 8. Approval of Fair Trade Legislation.

WHEREAS, forty-three states have adopted Fair Trade Laws designed to promote fair competition in the public interest, and

WHEREAS, legislation relating to such laws has been the subject of profound discussion for a period of the last twenty-five years, and

WHEREAS, the recent Congress has given the most serious consideration to such legislation from every conceivable point of view

Be It Resolved, that the ASSOCIATION deplores the campaign of obviously inspired misstatements, wilful perversions and patent attempts on the part of certain newspapers to confuse and to mislead the public as to the immediate and ultimate economic effect of these laws.

No. 9. Appreciation of Efforts of Senator Tydings and Congressman Miller.

Resolved, that the ASSOCIATION express its deep appreciation to Senator Tydings and to Congressman Miller for their parts in bringing about the enactment of the Tydings-Miller Act.

No. 10. Continuance of Committee on Professional Information Pertaining to Dental Pharmacy.

Resolved, that the Committee on Professional Information Pertaining to Dental Pharmacy of the ASSOCIATION, be continued.

No. 11. Continuance of "Flash System."

Resolved, that the "Flash System," used with such marked success at this convention, be adopted at all future conventions.

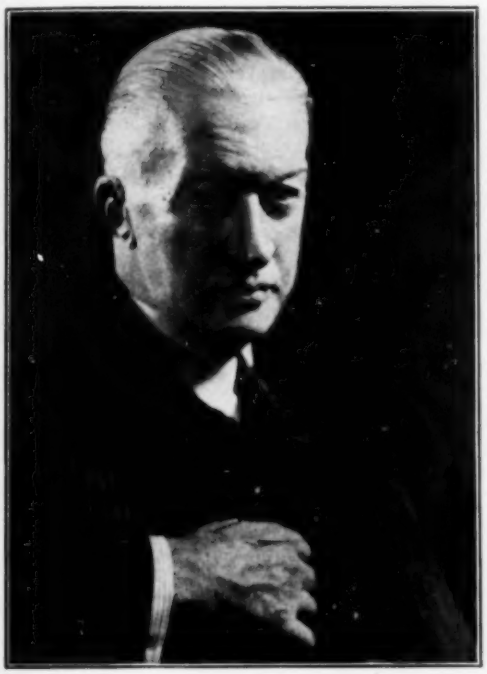
No. 12. Resolution of Thanks to Host.

Resolved, that the ASSOCIATION express its appreciation to the Local Secretary, to the Local Committee, to the Hotel Pennsylvania and to all others who contributed to the success of the convention.

EDITORIAL NOTES

JOHN RUSSELL POPE.

John Russell Pope, architect of the AMERICAN INSTITUTE OF PHARMACY, died August 27th. He designed the Mellon Art Gallery in Washington, and the addition to the British Museum and Tate Gallery in London, provided by Lord Duveen and dedicated by King George on June 28th. Pharmacists are proud of the fact that he was the architect of the AMERICAN INSTITUTE OF PHARMACY.



JOHN RUSSELL POPE.
Designer of the AMERICAN INSTITUTE OF PHARMACY, Washington, D. C.

Among many of the buildings designed by the deceased are the following:

Scottish Rite Temple, Washington, D. C.; MacDonough Memorials, Lincoln Memorial, Hodgenville, Ky.; Constitution Hall, D. A. R., and Archives Building, Washington, D. C.; the Baltimore Museum of Art, Baltimore, Md.; Architect selected for Roosevelt Memorials, New York City and Washington, D. C.

Quoting from an editorial of the *Washington Evening Star:* "Something poignantly tragic is represented in the circumstance of the death of John Russell Pope following immediately upon that of Andrew Mellon. The two men were related by the genius which distinguished them both—a constructive instinct which prompted the one to enlist the help of the other in the creation of a great monument of national service, the gallery of art which is to house Mr. Mellon's pictures and to reflect Mr. Pope's skill and experience as a master architect. It is an infinite pity that neither the philanthropist nor the designer could see his work completed; however, Mr. Mellon closed his career content in his mind about it; Mr. Pope, likewise, was satisfied that his composition would be finished in the spirit in which it had been begun. The vision was mature."

"His plans for the Archives Building made it, in the judgment of President Hoover, 'an expression of his American soul.' The AMERICAN PHARMACEUTICAL ASSOCIATION'S Building, opposite the Lincoln Memorial, is surely one of the noblest small structures of modern times—'a gem of loveliness.'"

"Mr. Pope was a classicist, philosophically loyal to the ancient traditions of dignity in design. He did not experiment. Rather, it was his choice to be faithful to the natural principles which the Greeks discovered and upon which not even the Gothic poets improved."

A panel of the American Institute af Pharmacy representing Light and Hope.

THE NEW YORK A. PH. A. MEETING.

It has not been possible, on account of the work preceding the 85th annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, to include all the contributions of the sections intended for this issue, nor report convention items in a comprehensive way. Editorial comment has been made and further references of the meeting will appear in succeeding issues of the JOURNAL.

The Local Secretary, Hugo H. Schaefer, and his able co-workers arranged the activities in an order that contributed to the success of the 1937 meeting. The committee in charge of publicity was eminently successful in giving the news to the press which prompted a number of editorials in the daily papers.

An issue of *Drug Topics* brought "Remembrances of Things Past," and its Convention Specials kept those in attendance informed relative to the programs and events of the day and of items from the sessions, the conferences, the sections and of related organizations.

The evident spirit of coöperation prompts this writer to express appreciation to all pharmaceutical publications for their great help in making this convention a wonderful success—by their issues before, during and after the meeting.

The entertainments were well planned and directed by the host for the pleasure of all who attended; their response was as genuine as the welcome. Evident enjoyment was the rejoinder in all the events.

The proceedings of the 85th meeting will be published in a Proceedings Number of the JOURNAL, which will also include the Constitution and By-Laws and the list of members.

PERSONAL AND NEWS ITEMS.

A few items follow, others will be published later.

Dr. Warren F. Draper, Acting Surgeon General, United States Public Health Service, was the speaker at the First General Session of the New York meeting on the subject of Disease Control.

R. Lopez Irizary, Chairman of the Board of Pharmacy of Porto Rico, brought with him an invitation for the ASSOCIATION to hold the annual meeting on the Island; he participated in the work of the sessions.

The president of the American Chemical Society, **Dr. E. R. Weidlein,** director of the Mellon Institute, presented the subject of Industrial Research most interestingly, giving information on the development of manufacture in various industries that astonished the greater number of the hearers.

Dr. Paul N. Leach, of the Council on Pharmacy and Chemistry of the American Medical Association, informally discussed Medicine and Pharmacy.

Dr. Adolph DeSanctis, president of the Medical Society of the County of New York, and **Dr. John Oppie McCall,** director of the Guggenheim Dental Clinic, spoke at the Banquet and thus the divisions of medicine were well represented.

Dr. E. L. Newcomb maintained his reputation as toastmaster, adding to the interest of a delightful meeting and banquet that was thoroughly enjoyed by the guests. A mysterious stranger closed the speakers' program without disclosing his identity and nationality. Music and dancing were enjoyable features.

Dr. R. J. B. Stanbury, *Secretary* of the Canadian Pharmaceutical Association, and **F. A. Jacobs,** *Secretary* of the Ontario Retail Druggists' Association, were in attendance at the New York meeting of the A. PH. A.

Dr. Kurt Feinstein, of Switzerland, and Dr. George Urdang, of Berlin, Germany, participated in the work of several of the sections. Dr. Feinstein is a pharmacist of Zurich—the Victoria Apotheke. He has recently completed comprehensive research on "Percolation," which has been published. **Dr. G. Urdang** is co-author with Dr. A. Adlung, of "Grundriss der Geschichte der Deutchschen Pharmazie," a book of about 700 pages on the history of German pharmacy. He is a well and favorably known authority on historical subjects and author of a number of books.

Both visitors were speakers before the Section on Historical Pharmacy. Dr. Urdang also addressed the section on Education and Legislation. He is an honorary member of the ASSOCIATION and Dr. Feinstein is now an active member.

Dr. Autun Urgoc—Richard Wasicky, head of the Pharmacological Institute, Vienna, Austria, was elected honorary member of the A. PH. A.

Mrs. H. M. Whelpley, who was present at the meeting in New York, has a chain which speaks of 44 meetings she attended, most of them with her husband, the late H. M. Whelpley, president 1901–1902 and treasurer 1908–1922. Mrs. Whelpley has donated many editions of the U. S. P., many photographs, lan-

tern slides and made other valuable contributions and more are to follow.

Mrs. John G. Godding, widow of President Godding, 1911–1912, was present. She is now planning a contribution in memory of her husband. This is to furnish a room in the AMERICAN INSTITUTE OF PHARMACY.

The longest distance traveled by a registrant of the meeting was by Prof. E. N. Meuser of the West China Union University, which supplies the trained pharmacists of that vast territory.

The President's Reception was a popular innovation, the officers and former presidents and their ladies received the guests. A musical composition, entitled "Pharmacy," words and music by A. A. M. Dewing, Centerville, Md., was played by the Orchestra.

The Hudson River Boat Trip was in charge of **Turner F. Currens.** The historic Hudson was enjoyed and stirred the memory of the historians, who endeavored to recall their studies of the period of Benedict Arnold, a New Haven druggist, and others of Revolutionary History. Dinner was served at Bear Mountain Inn.

President George D. Beal's broadcast of Pharmacy during the convention was well received by the public.

NEW AND NONOFFICIAL REMEDIES.

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.—PAUL NICHOLAS LEECH, *Secretary.*

COD LIVER OIL CONCENTRATE TABLETS-MERRELL.—A cod liver oil concentrate in the form of tablets, each having a vitamin potency of not less than 3,150 units (U. S. P.) of vitamin A and not less than 315 units (U. S. P.) of vitamin D. Each gram of tablet has a vitamin potency of not less than 5,380 units (U. S. P.) of vitamin A and not less than 538 units (U. S. P.) of vitamin D.

Actions and Uses.—Cod liver oil concentrate tablets-Merrell possess properties similar to those of cod liver oil so far as these depend on the fat soluble vitamin content of the latter.

Dosage.—Two tablets daily or as prescribed by the physician.

Manufactured by Wm. S. Merrell Company, Cincinnati. No U. S. patent or trademark.

The concentrate employed in the manufacture of cod liver oil concentrate tablets-Merrell is obtained from cod liver oil by concentration of its unsaponifiable fraction. The vitamin A and D potencies of cod liver oil concentrate tablets-Merrell are determined by the U. S. P. method; when assayed by

(*Continued on page 776.*)

COLLEGES AND FRATERNITIES.

Alumni of a number of colleges met at table and enjoyed the opportunities of talking over experiences and college days.

Fraternities and other organizations met to discuss business and enjoy the dinners and luncheons, among them: Kappa Psi Lambda, Kappa Sigma Sorority, Phi Delta Chi, Rho Chi.

News Week for August 28th devotes a page under Science to Pharmacy. Several papers of the Scientific Section are referred to the Lascoff Pharmacy, and a number of old pharmaceutical appliances.

OBITUARY.

JACOB DINER.

Dr. Jacob Diner, first Dean of Fordham University College of Pharmacy, died July 25th, after a lingering illness, aged 67 years.

The deceased was born in Russia and studied in Germany. He received his medical degree in 1913 and later was appointed Professor of Pharmacy when that college was organized under his direction. He was named dean of the College of Pharmacy, a position he held until April 1932, when he was succeeded by Dr. James H. Kidder.

Dr. Diner received a gold medal for twenty years of service at Fordham University. For many years he was active in the A. PH. A. and helped to organize the New York Academy of Pharmacy, of which he was the first president. He served as a member of the Pharmacopœial Revision Committee and was active in the affairs of pharmacy in New York State.

The deceased became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1906, and was active in many important services. He is survived by his widow, one son, Milton Diner, and a daughter, Mrs. Irene Koenigsberger, of Washington, D. C.

WILBUR HAUER.

Wilbur Hauer, manager of a Peoples Drug Store Branch in Washington, died August 24th of a heart attack while in a taxicab, en route to his home. He was born in Washington 53 years ago, and here he received his early education. He attended old Columbia University, now George Washington University, from which institution he graduated about 32 years ago.

(*From 1st column, page 775.*)

this method the product is required to have a potency of not less than 3,150 vitamin A units per tablet, or 5,380 vitamin A units per gram of tablet, and 315 units of vitamin D per tablet, or 538 vitamin D units per gram of tablet.

POLLEN EXTRACTS-MULFORD (See New and Nonofficial Remedies, 1936, p. 41).

Also supplied in complete treatment packages consisting of one 2 cc. vial containing 100 pollen units per cubic centimeter and one 10 cc. vial containing 5,000 pollen units per cubic centimeter.

Prepared by the Mulford Biological Laboratories, Sharp & Dohme, Philadelphia and Baltimore.

DEXTROSE (See New and Nonofficial Remedies, 1936, p. 286).

The following dosage forms have been accepted:

The Abbott Laboratories, North Chicago, Ill.

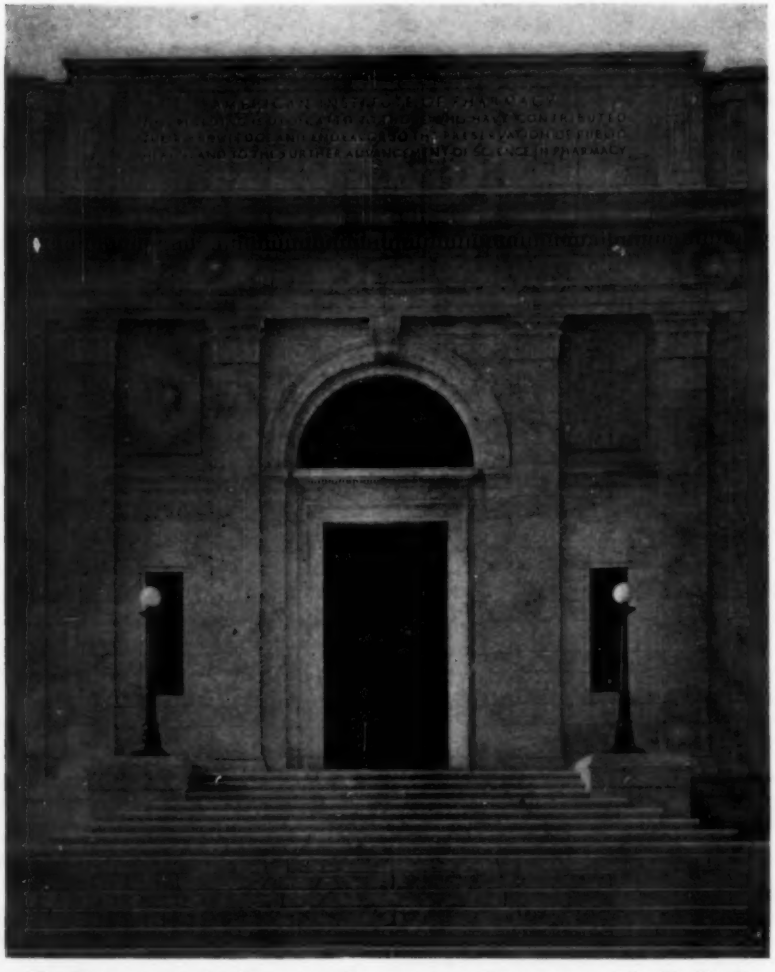
Ampoules Dextrose 50%, 10 cc.: Each ampule contains 10 cc. of a solution containing 6 Gm. of dextrose-U. S. P.

Ampoules Dextrose 50%, 100 cc.: Each ampule contains 100 cc. of a solution containing 60 Gm. of dextrose-U. S. P.

CARBARSONE (See New and Nonofficial Remedies, 1937, p. 93).

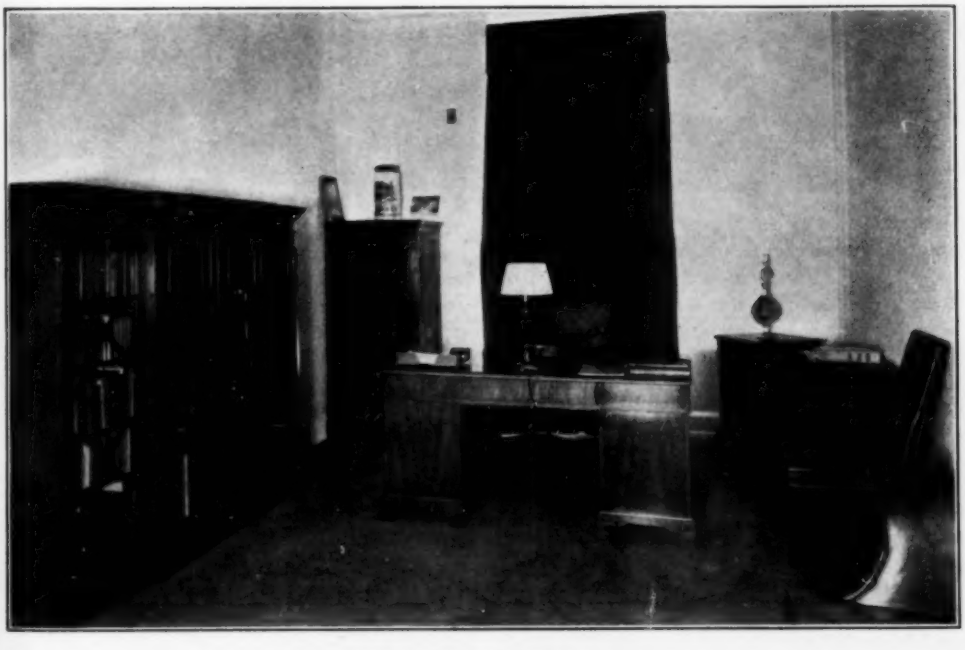
The following dosage forms have been accepted:

Tablets Carbarsone, 0.05 Gm. (3/4 *grain*).
Tablets Carbarsone, 0.25 Gm. (3 3/4 *grains*).
Suppositories Carbarsone, 0.12 Gm. (*2 grains*).
From *J. A. M. A.*, July 17, 1937.

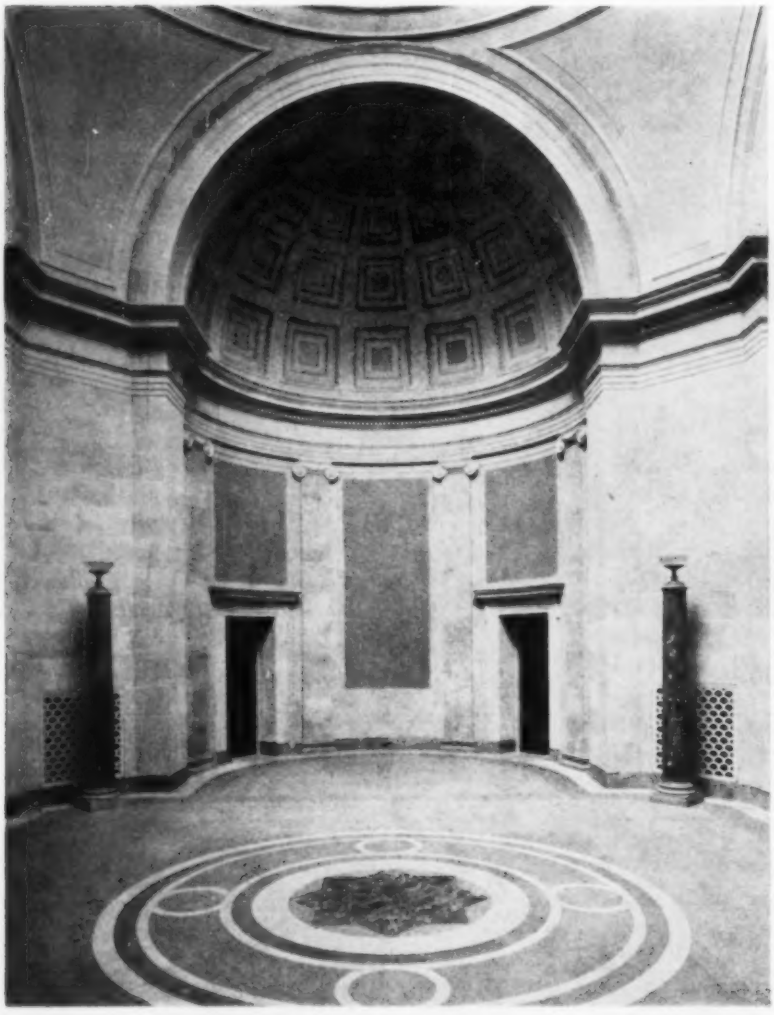


The Entrance to the AMERICAN INSTITUTE OF PHARMACY. The Dedication of the Building tops the Impressive Entrance of the AMERICAN INSTITUTE OF PHARMACY.

A section of the Secretary's Office.



A view of the Editor's Office.



The Foyer and Alcove of the AMERICAN INSTITUTE OF PHARMACY.

The *Drug Trade News* outlines what the Tydings Enabling Law does:

"(1) Amends the anti-trust laws to make it legal to send contracts establishing minimum prices across state boundaries into fair trade states.

"(2) Eliminates the need for a manufacturer to domesticate in fair-trade states in order to send fair-trade contracts to the retailers in those states.

"(3) Legalizes minimum price contracts between manufacturers and wholesalers who are located in different states, provided the wholesalers are located in states which have fair trade laws.

"(4) Removes federal obstacles to the enforcement of contracts which the states, through their own statutes, have made lawful.

"(5) Prohibits horizontal price agreement contracts between groups of manufacturers, or groups of wholesalers, or groups of retailers."

THE READING ROOM OF THE AMERICAN INSTITUTE OF PHARMACY.

The Reading Room of the AMERICAN INSTITUTE OF PHARMACY invites concentration. Architecturally the Room is beautiful. It has been adequately furnished by the late Franklin M. Apple in keeping with the spirit of the columns.

THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY.

The transactions of the AMERICAN PHARMACEUTICAL ASSOCIATION will be reported in the "Proceedings Number" of the JOURNAL and omitted here at this time. Robert L. Swain, Baltimore, Md., was elected *President* of the National Association of Boards of Pharmacy. J. W. Gayle, of Kentucky, was elected *Honorary President*. H. C. Christensen was renamed *Secretary*. George A. Moulton, retiring president, was elected to the *Executive Committee*.

The eight vice-presidents, who also serve as chairmen of their districts, are as follows: 1, William J. Dunphy, Connecticut; 2, Roy B. Cook, West Virginia; 3, Lew Wallace, Mississippi; 4, Sylvester Dretzka, Wisconsin; 5, E. Clare Severin, South Dakota; 6, Walter Varnum, Kansas; 7, R. C. Shultz, Wyoming, and 8, Linn Jones, Oregon.

Four new members of the syllabus committee are H. W. Parker, Arkansas; R. B. Rothrock, Indiana; Edward Kremers, Wisconsin, and R. P. Fischelis, New Jersey.

THE WECO CASE.

The Wisconsin State Supreme Court in the Weco Case Held:

That the Fair Trade act does not fix prices or require prices to be fixed.

That it does not regulate anything or anybody. It is permissive only. It is limited to merchandise identified by an exclusively owned trade-mark and sold in free competition with other goods of the same class.

That it allows a single producer or owner of commodities sold under his trade name or trade-mark and distributors thereof to make at their option contracts stipulating minimum resale prices for such commodities when sold at retail by or under such trade-mark, to the end that distributors thereof may be facilitated by ensuring dealers a profit and that good-will be protected by keeping known and identified merchandise free from deceptive use such as "loss leader" and "bait selling" and thus cheapening it in the public's estimation.

That instead of authorizing price fixing, the statute authorizes an effective check of any abuse in that respect.

MEETING ON FAIR-TRADE LAW.

The President signed the Tydings-Miller Bill on August 17th, and the law became effective immediately; it is now legal for manufacturers to make resale price maintenance contracts in the states having fair-trade acts even though the goods move in inter-state commerce. The announcement of the President's action was made on August 18th.

A meeting was called in Chicago by the N. A. R. D. to discuss the measure and take action on the enforcement of the law.

PLAN ADOPTED AT N. A. R. D. FAIR TRADE CONFERENCE HELD IN CHICAGO, ILLINOIS, AUGUST 30–31, 1937.*

(1) That retailers should refrain from all coercive measures;

(2) That retailers should not dictate or attempt to dictate resale prices;

(3) That the preparation or examination and approval of Fair Trade contracts should be handled by a National Board consisting of representatives of the N. A. R. D. and a representative of the National Association of Chain Drug Stores who shall advise with the Fair Trade Committees of each of the Fair Trade states as to the form of the Fair Trade contracts;

(4) That appropriate Fair Trade information and literature should be developed by the National Board and distributed in coöperation with the state organizations:

(5) That every effort should be made to induce the manufacturers to issue the manufacturer-retailer form of contract in preference to the wholesaler-retailer contract;

(6) That in order that the National Board may have the counsel and advice of the several Fair Trade states, an Advisory Fair Trade Committee consisting of one member from each Fair Trade state shall be designated, in a manner to be determined by each of the several Fair Trade states;

(7) That the cost to the manufacturer of issuing Fair Trade contracts and providing for their enforcement should be reduced to the lowest possible amount, and that the manufacturer's annual service charge by the respective State Fair Trade Committees shall be on such basis as shall be determined by the National Board with the advice and consent of the Advisory Fair Trade Committee;

(8) That it is desirable that actions for violations under the Fair Trade Acts and Fair Trade contracts be prosecuted by the trade-mark owner;

(9) That the services of the N. A. R. D. Legal Department be made available whenever requested to the respective state and local Fair Trade committees and to their counsel;

(10) That a National Advisory Council should be established composed of representatives of manufacturer, wholesaler and retailer groups and that similar bodies should be established in each Fair Trade state;

(11) That other trade groups should be invited to elect representatives to the Fair Trade Advisory Councils;

(12) That consideration should be given to the selection of outstanding citizens to represent consumers on the Advisory Councils.

* R. L. Swain, *Chairman*, Attorney Herbert Levy and Secretary E. F. Kelly were present. Thirty-six states were represented.

OFFICERS OF THE A. PH. A. SECTIONS.

Scientific Section.—*Chairman*, B. V. Christensen, Gainesville, Fla.; *First Vice-Chairman*, C. F. Lanwermeyer, Waukegan, Ill.; *Second Vice-Chairman*, J. M. Dille, Seattle, Wash.; *Secretary* (three years), F. E. Bibbins, Indianapolis, Ind.; *Delegate to the House of Delegates*, Glenn L. Jenkins.

Section on Education and Legislation.—*Chairman*, George A. Moulton, Peterboro, N. H.; *Vice-Chairman*, John F. McCloskey, New Orleans, La.; *Secretary*, A. O. Mickelsen, Portland, Ore.; *Delegate to the House of Delegates*, Geo. C. Schicks.

Section on Practical Pharmacy and Dispensing.—*Chairman*, W. J. Husa, Gainesville, Fla.; *First Vice-Chairman*, L. W. Richards, Missoula, Mont.; *Second Vice-Chairman*, R. W. Clark, Madison, Wis.; *Secretary*, Louis C. Zopf, Iowa City, Iowa; *Delegate to the House of Delegates*, H. A. K. Whitney.

Subsection on Hospital Pharmacy.—*Chairman*, J. Solon Mordell, Syracuse, N. Y.; *Secretary*, S. W. Morrison, Chicago, Ill.

Section on Pharmaceutical Economics.—*Chairman*, Henry F. Hein, San Antonio, Texas; *Vice-Chairman*, Paul C. Olsen, Philadelphia, Pa.; *Secretary*, Joseph H. Goodness, Boston, Mass.; *Delegate to the House of Delegates*, Frank A. Delgado.

Section on Historical Pharmacy.—*Chairman*, E. J. Ireland, Gainesville, Fla.; *Secretary*, Will T. Bradley, Boston, Mass.; *Historian*, E. G. Eberle, Washington, D. C.; *Delegate to the House of Delegates*, Loyd E. Harris.

Conference of Pharmaceutical Association Secretaries.—*President*, Prescott R. Loveland, Trenton, N. J.; *First Vice-President*, J. B. Pilchard, Harrisburg, Pa.; *Second Vice-President*, R. E. Lehman, Brooklyn, N. Y.; *Secretary-Treasurer*, J. Lester Hayman, Morgantown, W. Va.; *Executive Committee:* Irl R. Brite, Little Rock, Ark.; F. V. McCullough, New Albany, Ind.; Otis F. Cook, Lansing, Mich.; J. W. Slocum, Indianola, Iowa. *Delegate to the House of Delegates*, F. V. McCullough.

Conference of Pharmaceutical Law Enforcement Officials.—*Chairman*, R. L. Swain, Baltimore, Md.; *Secretary-Treasurer*, M. N. Ford, Columbus, O.; *Delegate to the House of Delegates*, J. B. Pilchard, Harrisburg, Pa.

BRIEF ABSTRACTS FROM A FEW OF THE PHARMACY WEEK RADIO MESSAGES.

THE following are given as brief examples for radio messages and special talks; the speakers will enlarge on the subjects.

E. L. Newcomb, Secretary of the National Wholesale Druggists' Association, in one of his radio addresses, gives a few statements on the origin of some of the important drugs:

Aloe, one of the most valuable laxatives, represents the dried juice of the leaf of a plant. Part of this comes from the Island of Barbados, off the northern coast of South America. Barbados Aloes are packed in gourds. Aloe also comes from eastern Africa. The Aloe coming from this latter source is packed in monkey skins. Medicinal Rhubarb and many other drugs come from India and Egypt. Cinchona Bark, yielding Quinine, comes chiefly from the East Indies, although some is obtained from the eastern slope of the South American Andes. Digitalis comes chiefly from Central Europe, although it is now being successfully produced in this country in Minnesota and in the vicinity of Philadelphia. A hundred or more vegetable drugs come from plants growing natively in the United States, chiefly along the Southern Appalachian Mountain Range.

J. Solon Mordell of the University Hospital, Syracuse, N. Y., makes the following statements regarding Pharmacy as a public health profession.

"Pharmacy is recognized as a public health profession in every civilized nation of the world. Its practice is regulated by law." The following is quoted from the Code of Ethics of the AMERICAN PHARMACEUTICAL ASSOCIATION: "Pharmacy has for its primary object the service which it can render to the public in safeguarding the handling, sale, compounding and dispensing of medicinal substances.... The pharmacist should hold the health and safety of his patrons to be of first consideration."

The final report of the Committee on the Costs of Medical Care states: "Drugs and medicines and medical supplies are essential to an adequate medical service, both therapeutic and preventive. Most of them are dangerous if unwisely employed. The preparation, standardization and distribution of drugs, medicines and medical supplies should be limited, as far as possible, to pharmacists who are prepared by education and training to render this responsible service and to protect the public against abuse. Physicians and pharmacists should unite to provide the public, as economically as possible, with efficient remedies and to protect consumers from exploitation."

In one of his radio messages, Former President (A. PH. A.) H. V. Arny dwells on the responsibilities and qualifications of the pharmacist:

"Every day, in every drug store the issues of life and death are in the balance. The pharmacist deals with the most potent remedies known to mankind. The successful application of these remedies brings relief to the suffering, whereas an error in compounding brings distress or even death to the user of the dispensed medicine. Some remedies, while of marked value when rightly employed, bring grave results when improperly or excessively used. The pharmacist must have a careful training, not only in common honesty but also in the ethics of his profession. He must have a well-grounded scientific knowledge of the medicines he dispenses. This knowledge can only be obtained by a thorough course of training at a good college of pharmacy.

"In any community the retail pharmacist of the right sort is held in high respect by the people of his neighborhood. He is a man of education who has won from the state a franchise to carry on a business that is largely profession. He is entrusted with the grave responsibilities surrounding the legitimate dispensing of drugs, chemicals and poisons. He is designated by the National Government as the only person deemed fit to dispense narcotics and alcoholic medicaments upon physicians' prescriptions. A fine, well-trained pharmacist who properly attends to his business wins the admiration of his community and establishes himself as a thrifty and public-spirited citizen."

HENRY G. RUENZEL, Honorary President, A. Ph. A., 1937–1938.